

Village Ethnoarchaeology

Rural Iran in Archaeological Perspective

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Preface

In 1967, as participants in the Royal Ontario Museum's Godin Tepe excavation project, the other staff members and I were lucky enough to live in an Iranian village. Then and during several years of archaeological fieldwork in western Iran in the late 1960s and early 1970s, I visited a number of villages. My interest in living villagers and their material surroundings grew with each archaeological field season, in part because contemporary villages—in many respects—resemble those at which my colleagues and I excavated. Iranian villagers working with us often helped us to puzzle out how some of the prehistoric artifacts and structures we unearthed had been used.

During this period, I also read ethnographic accounts of Middle Eastern communities. Ethnographers, of course, have their own research problems, and their publications cannot be expected to deal with all that would be of interest to archaeologists. For the most part, anthropological descriptions of Middle Eastern villages available then lacked details of material culture, spatial organization, subsistence economy, and other aspects of rural life with which archaeologists working in the area are often concerned. Returning in 1973 from an excavation season during which I had been fortunate in being given an exceptionally detailed tour through one village, I determined to return to that or a similar community to carry out ethnographic work with an explicitly archaeological

orientation. I was encouraged by discussions with several people, among them Patty Jo Watson, who had already completed an important archaeologically oriented ethnographic study elsewhere in western Iran in conjunction with the multidisciplinary expedition directed by the prehistorian Robert J. Braidwood.

By now, of course, there are some well-known case studies in a growing and varied corpus of ethnoarchaeological work. Much of the research published to date was done among hunter-gatherers; the better-known studies were carried out in Africa, Alaska, and Australia. Ethnoarchaeological work has also been done among agriculturalists and pastoral nomads elsewhere but, by the mid-1970s, comparatively little archaeologically oriented ethnography had been done among Old World "peasants" or in more complex societies. My own immediate geographic interest was the Middle East, which considerable archaeological work had shown to be one of the world's first areas to experience both a "neolithic revolution" and the development of complex state societies. Some of the detailed ethnoarchaeological studies of collecting peoples in other parts of the world had little direct bearing on early farming systems in Southwest Asia, and the few important studies done in the area had not yet been fully published. In 1974 I returned to Iran to discuss my project with officials and villagers, and in 1975 I did the fieldwork described in this volume.

I selected for ethnographic observation a "traditional" and apparently egalitarian and undifferentiated community, viewing it from the perspective of an archaeologist who might excavate at a similar site. Paleoenvironmental and archaeological data for the region strongly suggest that many features of the adaptation I observed have substantial time depth. This study focuses on selected tangible features of the community in which I worked, and suggests that despite villagers' assertions that they are "all alike," their households and associated material culture in fact are not. In pointing to the place of this community in a larger regional context, I have commented on variability among settlements as well as among regions, and provided data on some "norms" as well as diversity that should interest both archaeologists and ethnographers. I also discuss some of the complexities in relationships among population density and settlement age, area, and function. These variables and their interactions rank high among those discussed in archaeological reconstructions of prehistoric demography, changing subsistence strategies, and transformations in social and political relationships among settlements articulated on a regional scale.

This study differs from more traditional ethnographic works on Middle Eastern communities in its focus on material correlates of sociocultural behavior; it differs from other ethnoarchaeological studies in this geographic area in its detailed consideration of spatial organization and architectural variability, attention to broader regional patterns, and discussion of archaeological sampling strategies. It adds to a corpus of case studies designed to answer questions arising in the analysis and interpretation of archaeological data from a crucial geographic area

and contributes, I hope, to the literature on what has come to be termed “middle-range theory.”

While this study was written especially with archaeologists’ interests and questions in mind, and its emphasis is on material and locational aspects of a long-established lifeway, it records features of contemporary Middle Eastern life which are of interest to ethnographers. The geographic focus is Iran, but some of the material and social features of the way of life described here are paralleled in other parts of the world; this book should also interest students of South Asia, Africa, Mesoamerica, and the American Southwest, and it addresses theoretical issues of concern to archaeologists working in other areas as well. If this study provokes discussion among, and further research by, specialists in other areas as well as those working in the Middle East, it will have succeeded in one of its primary goals.

Acknowledgments

Many colleagues and friends in Iran and North America helped to bring this book to fruition. For their considerable courtesy, interest, and assistance in facilitating my 1975 research, I am most thankful to many kind employees of the Ministry of Culture and Arts in Tehran, Kermanshah, Hamadan, and Kangavar who must, regrettably, remain unnamed.

Over the years, and in instances and ways too numerous to recount, the American Institute of Iranian Studies has assisted many scholars, both American and Iranian. I personally feel greatly indebted to Jerome and Jane Clinton, who directed the Institute in Tehran during 1974; to David and Orick Peterson, who were there in 1975; and to their administrative assistant, all of whom graciously and generously gave me much good-natured help and expert advice. In Kermanshah, I had the friendship, hospitality, conversation, and aid of Lou and Dori Levine and the staff of the 1975 Royal Ontario Museum's Mahidasht survey project. In Kangavar and "Aliabad," I profited from the expertise of Claus Breede, then of the Royal Ontario Museum and now director of the Bruce County Museum (Ontario), who served as project architect. I also thank David Stronach, former director of the British Institute of Persian Studies in Tehran, for the hospitality and help that he and his family and staff gave me and other Americans during the 1960s and 1970s.

In New York, Kay Ryan and Barbara Bralver, respectively former and current grants officers at Lehman College (City University of New York), provided invaluable administrative support, and Manuchehr Kasheff (Columbia University) helped me to improve my command of colloquial Persian prior to my departure for Iran in 1975. I am grateful to Claus Breede for his architectural plans, Kathleen Borowik and Susan Galluci for most of the remaining drawings, and Judith Berman for her patient and conscientious assistance in the preliminary stages of data analysis. More recently, assistance was also provided by Roselle Henn and Richard Smilowitz; I thank them, and Sydel Silverman, executive officer of the Doctoral Program in Anthropology of the City University of New York, who was instrumental in obtaining financial support for them. The research published here was supported by the National Science Foundation (BNS 75-80507 A01) and the Professional Staff Conference-Board of Higher Education of the City University of New York (RF-10654, RF-11357).

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Most important, I wish to record my profound respect and deep affection for, and enormous debt of gratitude to, the very kind inhabitants of "Aliabad," to whom this book is dedicated. Their patient, good-humored, graceful, and generous response to this foreign visitor extended well beyond the bounds of customary though extraordinary Iranian courtesy and cordiality. Their "place" is, as they would say, green, and to my deep sorrow it is very empty.

Author's Note

The “ethnographic present” in this study is 1975 A.D. (1354 A.H.). From the inception of the research, I had planned to protect the identity of individuals and communities by ensuring their anonymity. This decision accords both with common anthropological practice and with the expressed desires of some of the villagers who generously facilitated my 1975 fieldwork. Despite the many changes that have taken place in Iran since 1975, my decision remains unchanged.

In earlier publications, the pseudonymous village described here was referred to as “Shāhābād.” This name was first suggested as a possibility in 1975, when several villagers asked me whether prehistoric sites in their area had been ruled by *shāhs*. There is a well-documented history of cultural achievements under many earlier monarchs (Persian: *shāh*). *Shāh* is an element in many personal and place names, and Shāhābād is the name of many real Iranian communities; it means “the place founded by the king” or “the king’s place,” and is a usage predating the recent Pahlevi rulers. Thus, for a number of reasons, this pseudonym seemed acceptable; it was not meant to have a political cast; nor did its choice imply a particular political viewpoint on either my part or those of my informants.

Because the pseudonymous village name had appeared in earlier publications,

I was strongly tempted to retain it here. However, given events of 1978 and subsequent years, the former pseudonym has been replaced here by “‘Alīābād.” ‘Alī is a very common Muslim name, and in western Iran it is also frequently an element in place names.

For the sake of simplicity, but at the risk of being branded philologically unsound, I have not used diacritical marks in English transliterations of these and other Middle Eastern place names and words.

1

Ethnoarchaeology: Some Assumptions and Practices



ETHNOARCHAEOLOGY: A RESEARCH STRATEGY

Unable to observe the people and activities that produced the residues they study, archaeologists seek information about contemporary behavior that may illuminate the past, and often incorporate ethnographic data in their reconstructions. Some have taken to the ethnographic field, to collect data on material and locational aspects of ongoing sociocultural systems. Most commonly termed “ethnoarchaeology,” this endeavor has also been referred to as “archaeological ethnography,” “archaeoethnography,” “action archaeology,” and “living archaeology.” In its broadest sense, ethnoarchaeology refers to problem-oriented ethnographic research most often conducted by anthropologically trained archaeologists. The rubric covers a set of diverse research strategies and problems formulated in response to questions raised in the collection, analysis, and interpretation of data derived from archaeological contexts.

Ethnoarchaeological research investigates contemporary behavior and material culture from an archaeological perspective; ethnoarchaeologists attempt to define relationships between behavior and material culture not often explored in ethnographic work, and to ascertain how observable behavior might be reflected in remains which archaeologists can find. Incorporated in the archaeological

record, residues like those that are forming today may be used to develop inferences about the behaviors with which they were associated. Many ethnoarchaeologists believe that observations of contemporary behavior can facilitate the development and refinement of insights into past behaviors, and that such insights have greatest credibility when strong similarities can be shown to exist between the environments and technologies of the past and of the present.

Ethnoarchaeological studies deal with a wide range of empirical, methodological and, to a lesser extent, theoretical issues (Donnan and Clewlow 1974; Gould 1978b; Kramer 1979b; Stiles 1977). Some focus on object manufacture and use (DeBoer and Lathrap 1979), while others deal with the nature of object curation and discard and the formation of the archaeological record (Ascher 1968; Binford and Bertram 1977; Crader 1974; DeBoer 1974). Other studies, also concerned primarily with portable objects, examine the relationship of archaeologists' classifications to those of the people manufacturing the objects archaeologists study, or to the functions of these objects (Gould 1974; Gould *et al.* 1971; Hardin 1979; White and Thomas 1972). Some ethnoarchaeological research has investigated relationships between activities and the spatial distributions of objects used in those activities (Binford 1978a; David 1971; Yellen 1977), as well as relationships between spatial arrangements and diagnostic features of material items associated with social units (Bonnichsen 1973; Longacre and Ayres 1968; Rathje 1974; Yellen 1977). In addition, several studies focus specifically on material correlates of subsistence-related behavior (Binford 1978a; Binford and Bertram 1977; Jochim 1976; Messer 1979; Yellen 1976), and a few deal with demography (Binford and Chasko 1976; Kramer 1979a; Sumner 1979) and analysis of various issues on a regional scale (Ackerman and Ackerman 1974; Hole 1979; Jochim 1979; Lees 1979).

As a methodology, ethnoarchaeology has the potential to contribute to the increasing refinement of the investigation of variables and relationships of broader anthropological interest. For example, among the theoretical issues frequently discussed in anthropological writing are the causes and consequences of population change, and the nature and causes of transitions from egalitarian to ranked and stratified modes of organization. Demographic transitions are sometimes viewed as causally related to such organizational changes, and the characteristics and spatial organization of land use are related to both issues. Because such changes occurred in several geographic areas, over long periods of time, and generally in the absence of written documentation, they are best investigated archaeologically. Long-term regional population figures, currently used in both descriptions and explanations of a variety of sociocultural transformations, are derived from archaeological survey data and are thus ultimately based on estimates of individual sites' populations. Such estimates also reflect assumptions about technology, subsistence, and land use practices. Given the paucity in the ethnographic literature of descriptive demographic data framed in both local and regional terms, ethnoarchaeological research is a potential source of data for both

site and regional population estimates, and could have a significant impact on our ability to monitor and ultimately to explain population dynamics in diachronic, evolutionary terms.

Archaeological settlement-pattern data have also been used to identify levels of organizational complexity. The analysis of regional data presupposes some understanding of relationships among variables at the local level, and the identification of organizational features and explanations of organizational change have often been based on excavated remains. Because ethnographic studies often do not provide answers to questions archaeologists tend to ask, archaeologists have increasingly relied on geographers' research on the spatial organization of regions.

The related issue of the emergence of ranked societies has been discussed by a number of anthropologists—among others, Fried (1967) and Service (1971). Yet material and locational aspects of variation in rank are rarely discussed in the ethnographic or geographic literature. To be most useful to archaeologists, ethnographic models of variation in rank should be translated into operational measures before variations observed in the archaeological record are interpreted as evidence for ranking. This has not often been systematically attempted (Peebles and Kus 1977; Watson 1978), and ethnoarchaeological fieldwork exploring relationships between rank and material culture might produce interesting results.

No one study can treat all of these issues extensively or exhaustively, nor can any single data set solve all archaeological problems. In the following pages I discuss empirical data from a contemporary sociocultural system, and suggest that they might be useful in interpreting some aspects of the archaeological record. Selected features of spatial organization, material variability, and economic rank within one settlement are described from the perspective of an archaeologist investigating a single site. Shifting the scale of observation and analysis from the local to the regional level, this study also reviews relationships between land use, settlement area, and population—variables that have entered into recent considerations of regional manifestations of organizational variation and change. Much of the material on which the study is based was collected by me in Iran; supplementary data are drawn from the published ethnographic record for Iran and other countries in Southwest Asia, one of the first world areas to experience the major demographic and organizational transformations that culminated in complex state societies.

ETHNOGRAPHIC ANALOGY

The comparability of past and present human behaviors, the relationship of behavior to the material record, and the extent to which theoretical and methodological rigor can be maintained in positing such correspondences have figured in discussions of ethnographic analogy, at the conceptual heart of ethnoar-

chaeology.¹ Many archaeologists distinguish between a “direct historic” approach (in which continuities within a given geographic area can be demonstrated or reasonably assumed) and “general” analogy (Chang 1967), which is not restricted to comparisons of archaeological and contemporary data from the same geographic area. Several archaeologists have reviewed the limitations of analogical reasoning in archaeology; L. Binford (1967, 1968, 1972) is among the few providing explicit examples of its applications.

Those arguing for an even more explicitly defined and rigorous use of analogical reasoning have pointed out that it is invalid to assume that all forms of past behavior are paralleled in the present. This is perhaps most forcefully argued in the case of hunter-gatherers, who today occupy a more restricted range of habitats than did those of the Pleistocene (Freeman 1968). An unfortunate tendency to view hunter-gatherers as behavioral isolates further limits our understanding of such adaptations in both present and past (Wobst 1978).

It is also incorrect to assume that all forms of cultural behavior that may be observed today have analogs in the past. For example, because early pre-*sapiens* populations differed physiologically from *Homo sapiens sapiens*, we may assume that biologically determined aspects of early hominid behavior differed in some respects from those of modern forms. This point has been used by some to reject categorically the use of analogy in dealing with archaeological remains older than about 50,000 years (S. Binford 1968a). However, some of the variables affecting pre-*sapiens* behavior (such as attributes of species and other resources exploited) can be analyzed today; some of the constraints on subsistence, settlement pattern, and variation in local group size of earlier hominids are amenable to analysis and thus to the interpretation of their archaeological remains. Examples of this approach are provided by Gould (1980), Martin (1973), Speth and Davis (1976), and Wilkinson (1972). Proliferating research in primate and carnivore ethology, and ongoing developments in theoretical ecology, should contribute to the continued refinement of efforts to understand the behavior of pre-*sapiens* populations. It would be fatuous to reject the use of contemporary data in attempting to understand the behavior of the earlier hominids, since *Homo sapiens sapiens* is the only culture-bearing species available for observation and questioning.

Despite these theoretical difficulties, a considerable body of anthropological research focuses on hunter-gatherers. In part, this is because food collection has been the characteristic subsistence adaptation for most of hominid evolution.

¹Analogy also raises problems in other fields. For example, the

controversy over temperature regulation in dinosaurs may never be resolved to everyone's satisfaction. Since dinosaurs cannot be rounded up and studied directly, both sides have to rely on their interpretations of the fossil record, which is incomplete, and on analogies with the physiology and anatomy of modern animals. All of the arguments—both pro and con—contain many opportunities for disagreement [Marx 1978:1426].

Collecting adaptations appear to be threatened with extinction, and it can be argued that those groups still functioning as foragers should be studied systematically before they are either decimated or even further submerged in and transformed by more complex societies. Thus, because remaining hunter-gatherers represent the socioeconomic adaptations of longest duration in human evolution, and are as a group most obviously near extinction and therefore not likely to be available for extended study in the future, they have been the subjects of much intensive ethnoarchaeological research. Because such groups have a limited distribution, research on hunter-gatherers has been geographically biased in favor of Alaska (e.g., Binford 1978b), Africa (e.g., Yellen 1977), and Australasia (e.g., Gould 1978a, 1980). The present study has a different geographic and topical focus. It centers on Southwest Asia, where collecting adaptations were replaced millennia ago by subsistence strategies based on plant and animal domesticates.

RESEARCH IN THE ZAGROS AREA

Although the archaeological record in Southwest Asia extends well into the Pleistocene, it has thus far been most extensively investigated for the post-Pleistocene period, which began some 12,000 years ago. The Zagros Mountains of eastern Iraq and western Iran have been the focus of relatively intensive investigation, yielding a wealth of archaeological detail from early villages and extending the record of a sedentary agricultural and stockbreeding adaptation back more than 7000 years (Figure 1.1). In contrast to the rich archaeological material recovered from prehistoric Zagros villages, ethnographic coverage of the area has been somewhat scanty and uneven, and much of the published literature lacks substantive details of material culture of the kind that interests archaeologists.

Visits to villages in the Iranian Zagros underscore one of the major gaps in the ethnographic literature: research efforts in this part of Southwest Asia have more often focused on nomadic pastoralists than on peasants. The work of Barth (1961) with Basseri, of Black-Michaud (1974), Feilberg (1952), and Amanolahi-Baharvand (1975) with Lurs, of Digard (1973) with Bakhtiari, of Oberling (1974) and Beck (1978) with Qashqa'i, and a survey by Monteil (1966) are representative of the ethnographic documentation of Zagros pastoralists. In more narrowly defined studies, Digard (1975) describes the spatial organization of Bakhtiari campsites, Edelberg (1966–1967) discusses transhumants' structures in Luristan, and Löffler and Friedl (1967) provide a catalog of the material culture of the Boir Ahmad of southwest Iran. Though differing from these formally ethnographic studies, the work of Stark (1936) and other travelers through the Zagros provides scattered but useful information about material culture and settlement pattern.

This corpus has recently been complemented by Hole's archaeologically oriented work among Luri-speaking pastoralists (1975, 1978, 1979). Hole's interest in contemporary transhumant stockbreeding groups stems from a long-term concern with the origins of food production, a desire to develop predictive statements regarding the location of pastoralists' settlements as well as to define their formal characteristics, and a wish to test the proposition that animal husbandry may have been as early a subsistence adaptation as agriculture.

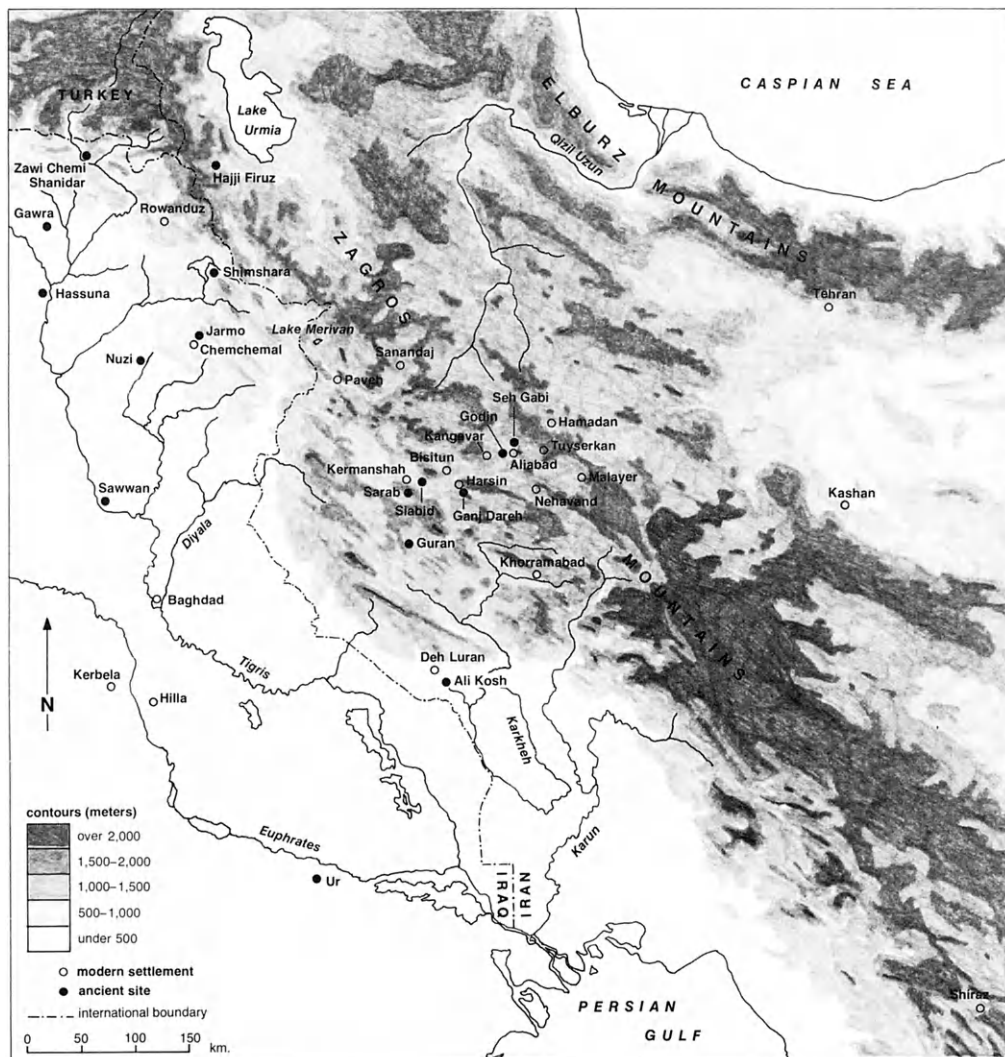


Figure 1.1. Modern and prehistoric settlements, Zagros area.

Systematic ethnographic research projects in Zagros villages have been fewer than those focusing on pastoralists. In the Iraqi Zagros, Leach (1940) worked briefly in the Rowanduz area; like Galloway (1958), who spent even less time in a village in northeast Iraq, he provides a rough sketch map and some details of village material culture and subsistence economy. Working farther south in Iraqi Kurdistan, Barth (1952, 1953) was primarily concerned with social and political organization. Hansen (1960, 1961), an ethnographer affiliated with a salvage archaeology project, published highly descriptive if somewhat more narrowly focused details of village life in Iraqi Kurdistan, and Mokri (1961, 1962) has done the same for Iranian Kurdistan. Austova (1970) published a brief study of Soviet Kurdish material culture, and some of DePlanhol's comments (1958, 1960, 1968) about village organization and architecture, based largely on data obtained in Iranian Azerbaijan, are relevant to areas farther south. These studies are anomalies within the vast literature on Kurdistan, characterized as it is by an emphasis on political history and twentieth-century separatist movements (Arfa 1966; Chaliand 1981).

In this brief enumeration of work done in Zagros villages, that of Watson (1966, 1978, 1979) merits special mention, for several reasons. First, as a staff member on an archaeological project, Watson collected data on three groups, ranging from sedentary villagers to pastoralists, in the area around Kermanshah (Iran); her study is thus somewhat unusual in its comparative orientation. Second, her work has provided details of village life not available in most other studies; most notably, she describes many features of social and economic organization, technology, village and house layouts, and other aspects of material culture. Third, her study of Hasanabad, a (pseudonymous) community of Laki-speaking "Kurds," provides a baseline against which the village described here may be compared.

The ethnoarchaeological work of Hole and Watson reflects, in part, an attempt to amplify the formally ethnographic coverage of the Zagros area. At the same time, these and ethnoarchaeological studies elsewhere have begun to redress a topical and geographic imbalance reflecting the preoccupation with contemporary hunter-gatherers noted above. In Southwest Asia, farming and herding replaced foraging many millennia ago; small-scale rural communities occupied year-round have long been an abundant and prominent settlement type, and one for which there is substantial archaeological evidence. Larger "urban" settlements with marketing and administrative functions also have a long history in this area. Studies of large centers, whose formal and functional differences from small-scale rural settlements should be reflected in their archaeological residues, are even fewer than those of villages. However, works on the Zagros cities Sanandaj (Alten 1959), Kermanshah (Clarke and Clark 1969), Malayer (Momeni 1976), and Shiraz (Clarke 1963) contain information that can be useful to archaeologists.

In the central Iranian Zagros—today the provinces of Luristan, Kermanshah-an, Kurdistan, and part of Hamadan—many features of contemporary subsistence economy, technology, settlement pattern, building materials and techniques, architectural layout, and portable objects are paralleled in a considerable, albeit diverse, body of archaeological data. The foregoing comments indicate that ethnographic coverage of this area might be described as uneven. In contrast, within the Zagros, central western Iran is among the few areas that have been extensively explored by archaeologists.² From the point of view of the archaeologist working in this area, deficiencies in the ethnographic literature are encountered in a search for quantified demographic data, details of settlements' spatial organization, house layouts and architectural technology and chronology, information about the manufacture, distribution, and functions of portable objects and about subsistence economy, material correlates of variation in economic rank, and relations among settlements.

The individual localized community, rather than the region, has generally been the focus of ethnographic research on sedentary Zagros populations. In archaeological terms, the individual settlement is a site; when the community's residents inhabit substantial structures, the site that it becomes most often assumes the form of a mound. Many ancient villages in the Zagros and surrounding foothill and alluvial areas of Iraq and Iran have been excavated during the post-World War II years; some of them are discussed briefly here. This work is by no means fully published, and the quality of data retrieval and analysis is uneven, but our understanding of some of the material excavated at these sites would nonetheless be enhanced were comparative ethnographic data available. Prehistoric village sites in the Zagros area have produced a large body of artifactual and architectural data, as well as botanical and faunal remains and some human burials and associated grave goods. In addition to regional and chronological variations observable in the archaeological materials excavated to date, the evidence available reflects variability in structures and artifacts and their differential distribution within any given site. Archaeologists attempting to analyze such data might wish not only to establish the functional identities of certain objects, features, or structures, but also, on a more general level, to determine the causes of variation in their types, numbers, sizes, and spatial distributions.

Because none of the excavated Zagros villages has been completely exposed, we lack comprehensive or even extensive plans for prehistoric settlements. Given

²Not all of this research has been published in detail; some of it is discussed in Chapter 6. Aside from the region of immediate concern in this study, other areas in the Zagros that are comparatively well known archaeologically include the Ushnu-Solduz valley system of western (Iranian) Azerbaijan, the Chemchemal (Kirkuk) area of northeastern Iraq, and the Marv Dasht area in Fars (Iran). Deh Luran, in the southern (Iranian) Zagros foothills, and the Susiana plain, at lower elevations in Khuzistan (Iran), have been extensively explored. Hole (n.d.) provides a comprehensive survey of archaeological work in the Zagros that has focused on early villages.

the operational necessity and the theoretical desirability of sampling archaeological sites—even small sites of 1 hectare (ha) or less—archaeologists must rely on a limited portion of any given site to infer the parameters of the entire settlement. This applies to attempts to estimate total village population size and density, to determine variations in house layout and the range of activities carried out in the village as a whole, and to reconstruct variations in social and economic status. Archaeological work in Southwest Asia has benefited to some extent from discussions of sampling (Binford 1964; Mueller 1975; Ragir 1967; Redman 1974; Redman and Watson 1970). However, without some knowledge of (for example) the range of variability within and among settlements, of how much of settlements' areas tends to be open space, and of how functionally different settlements may vary with respect to these and other features, extrapolations or claims for the "representativeness" of archaeological samples will be unconvincing.

That interpretive difficulties might arise in dealing with small excavated samples is suggested by observations of contemporary Middle Eastern villages. Activities vary seasonally, and they are often highly localized both within houses and within the village as a whole; not all standing houses are simultaneously occupied; some houses are multistory dwellings but most are not; some houses have enclosed gardens; building materials vary within a given settlement; portions of the village have no structures built on them; and not all structures within the settlement, however "undifferentiated" it might at first appear, need be residential in function. Archaeologically oriented ethnographic observations can elucidate relationships among objects, structures, and distributions that might be incorporated in the archaeological record, and the sociocultural behavior that, although associated with them, does not itself become a part of that tangible record.

The bulk of archaeological research in the Zagros area has been devoted to the excavation of individual sites. Traditionally, site survey in Southwest Asia has entailed the collection of surface artifacts, their dating with reference to comparable materials excavated at other sites, and the selection of one or more of the surveyed sites for excavation. Several recent survey projects represent a radical departure from this traditional approach. For example, the work in Iraq of Adams (1965) on the lower Diyala, and of Adams and Nissen (1972) on the lower Euphrates, and, in Iran, the work of Johnson (1973) on the Susiana plain, reflect an interest in the definition and explanation of long-term transformations in economic and political organization. Excavations at a single site contribute to the definition of spatiotemporal characteristics of artifact assemblages and to the development of sound regional chronologies, but they cannot in themselves clarify changes occurring on a regional scale, which are reflected in part by variations among sites. Arguments about economic and political change on the level of individual regions, and those comparing developmental sequences in two or more regions (e.g., Adams 1981; Adams and Nissen 1972; Johnson 1980),

often incorporate population estimates made for each period of occupation at each site. Ultimately such estimates are based on contemporary demographic data, as sparsely represented in ethnographic publications about Middle Eastern settlements as are details of their spatial organization. The paucity of empirical data from settlements of varying area and function has forced some archaeologists to use a single baseline figure in computing population sizes and densities for ancient villages and towns; the lack of comparable data for modern settlements of different functional size has caused some to argue, for operational purposes, that site area, function, and population are linearly correlated.

The focus on the lowlands of Greater Mesopotamia seen in the survey work of Adams, Nissen, Johnson, Wright (1969), and others reflects a long-standing interest among Middle Eastern specialists in Sumer and Elam, foremost among the area's earliest state systems. It has long been recognized that Elam included highland regions, and work in the Marv Dasht plain near Shiraz (Sumner 1972, 1976) promises to amplify and clarify the archaeological record of this early Zagros state. It remains to be seen whether comparable developments occurred elsewhere in the highlands, and to determine the nature and extent of interaction between lowlands and highlands. Additional archaeological data from the upland zones bordering the Mesopotamian alluvium will facilitate the reconstruction of spatial distributions of ancient settlements and the definition and interpretation of major organizational transformations. It should soon be possible to compare the evolutionary trajectories of Zagros groups with those already documented for neighboring lowland areas. In the central Iranian Zagros, relevant data will be drawn from surveys such as those carried out by Mortensen (during 1973 and 1974), Young (in 1974), Levine (in 1975 and 1978), and Mortensen and Smith (in 1977). Some of these surveys are discussed below.

SCOPE OF THE PRESENT STUDY

This study is based on three sets of contemporary data. The first is derived from ethnographic fieldwork carried out during the summer of 1975 near Kangavar, in central western Iran; the focus of that research was a single village (Aliabad), although a number of other villages in the area were visited then and had been in preceding years. A detailed interview schedule³ prepared prior to the 4-month research period was discarded when it became clear that many adult males were

³The village name is pseudonymous. I am greatly indebted to Laura K. Gordon (Montclair State College) and Karen O. Mason (University of Michigan) for suggestions and criticisms made during the development of the interview schedule, and to Carole Vance (Columbia University) and Daniel Bates (Hunter College), who generously provided me with interview schedules they had used in their own ethnographic fieldwork. Manuchehr Kasheff (Columbia University) assisted me in developing a bilingual (Persian-English) document once I had constructed an interview schedule; although in the end the schedule was not used systematically, his contribution to it in terms of specialized vocabulary proved invaluable in the field, as did his suggestions regarding appropriate forms of verbal conduct.

available for extended discourse only on a seasonal basis because of commitments to agricultural and urban work. Thus some potential respondents were available intermittently (and unpredictably) during the summer months, and standardized interviews with only those men remaining in the village would not have constituted a representative sample of the villagers as a whole. Standard techniques of participant observation and open-ended as well as focused interviewing were employed in data collection. An adult male informant-interpreter (who translated from Kurdish to Persian, when necessary) provided assistance almost daily; a substantial body of detailed qualitative information was provided by him and other members of his household, and by the members of three additional households. Conversations of varying length were carried out with at least one adult member of all the other households in the village. A village census made early in my fieldwork, with the assistance of several informants (including a midwife), was corrected with data obtained in subsequent interviews and conversations.

During the fieldwork, I made sketch plans during visits to most of the village's houses. An architect (C. Breede) subsequently prepared scale maps of the village and of four residential compounds. My plan to prepare a detailed map of the village cemetery was aborted because of the unforeseen death of several villagers under circumstances unrelated to my presence or my project. Following this event, my assistant asked me to refrain from mapping or photographing the cemetery, through which he had escorted me on several previous occasions. Under the circumstances my presence there might have constituted an infringement on village privacy. He also suggested that I not visit homes of the deceased. It was, however, possible to make partial maps of them, and some information about these few households was voluntarily provided by other villagers. In most respects, therefore, the Aliabad sample may be considered virtually complete.

Following the 1975 fieldwork, I reviewed two bodies of published information about other contemporary settlements in order to evaluate the impression, developed while visiting a number of villages in the Kangavar valley, that Aliabad was not particularly unusual among small-scale settlements in that area, and to establish the fact that some features of land use and settlement pattern seen in this region are found elsewhere in Southwest Asia. Specifically, the second contemporary data set used here consists of census and cartographic materials collected and published by the government of Iran. For the most part, these data are based on the 1966 census, and therefore refer to the decade preceding the fieldwork in Aliabad. Although it is clear from casual observations made by me and by colleagues during the 1960s and 1970s that important changes have occurred in the Kangavar area, it must be assumed, for operational purposes, that they have not significantly altered relationships among settlements. Further, the 1966 census was carried out following the 1962 land reforms, which were implemented in this region, so the overall village landholdings listed in the census publications and analyzed here have probably not changed substantially since

that time. These census data serve both to locate Aliabad within the range of variability observable within the Kangavar area and to illuminate regional patterns.

A corpus of published comparative ethnographic data constitutes the third set of modern data. It was reviewed to assess the extent to which this area is comparable to or different from other parts of Southwest Asia in terms of issues investigated here. This review both indicates that regional variations exist and permits the delineation of a few broad patterns that appear to obtain throughout much of the Middle East.

In addition to these contemporary data, which form the core of the descriptive material presented here, a sample (by no means "random") of archaeological data was examined with a view to comparing the contemporary and prehistoric occupations of portions of the central Iranian Zagros. Much of the archaeological research discussed here is not yet fully analyzed or published; observations based on these data are therefore provisional.

Aliabad is a pseudonymous community of approximately 400 Kurdish-speaking inhabitants. It is set in a mountain valley near Kangavar, a town of some 13,000 persons (in 1975), which is situated between the larger provincial capitals of Hamadan and Kermanshah (see Figure 1.1). Aliabad's economy is characterized by relative self-sufficiency, reflecting comparatively little market-oriented productive activity, agricultural intensification, or capital investment. Its principal subsistence resources (wheat, barley, sheep, and goats) have been heavily utilized in this area for over 7000 years. In these and other respects, Aliabad may be considered relatively "traditional," and thus potentially comparable to prehistoric settlements in this region; this factor weighed heavily in the selection of the research locality.⁴

A brief introduction to the village's population and spatial organization is given in Chapter 2, which focuses on the environmental setting and contemporary patterns of land use. Utilization of plants and animals is discussed, with particular emphasis on the ways in which these might be reflected in the archaeological record. The description of villagers' utilization of resources, and of variation in production and consumption, should interest archaeologists reconstructing these aspects of village life on the basis of excavations, as well as those employing survey data and focusing on villages' land requirements (a subject touched on in Chapter 5). Though there is apparently little variability in land use practices per se, there are variations in ownership of subsistence resources, and some of this variability has material correlates that might be detectable in the archaeological remains of such a village. Chapter 3 presents data on variation in

⁴While participating in archaeological projects of the Royal Ontario Museum in the late 1960s and early 1970s, I was able to visit several villages in the Kangavar area. Aliabad was selected as a research site not only because of its relative inaccessibility, described below, but because of its size, its proximity to excavated prehistoric village sites, and the cooperative behavior of its inhabitants, with whom, on occasion, I discussed possible interpretations of problematical archaeological features found during the course of excavations in the region.

control of livestock and fields used to rank households relative to one another, and summarizes some of the material correlates of variation among households. Residential architecture, which would provide abundant and well-preserved evidence to an archaeologist excavating this village, is discussed briefly in Chapter 3 and at length in Chapter 4. Variation within and among Aliabad's houses is related to the differential distribution of specialized activity areas and to variations in household size and composition. This vernacular architecture also reflects variations in the economic statuses of households. Aspects of village architecture here and throughout the Zagros area are paralleled at archaeological sites in building materials, construction techniques, spatial organization of residential structures, and variability among village houses.

Chapters 2, 3, and 4 consider aspects of a contemporary village from an archaeological perspective; the emphasis is on features of a single settlement that might be reflected in its archaeological residues. Chapter 5 expands the scale of observation and analysis to the regional level, and considers some aspects of the contemporary settlement system that might be reflected in unexcavated archaeological survey data. Data drawn from recent maps, photographs, and gazetteers are synthesized in a discussion of settlement area, population, and functional size.⁵ Relationships between settlement size and population are considered, as is evidence for covariation in settlement density and functional size. Evidence for relationships between village size and amount of arable land utilized is reviewed, and compared with some of the data on production and consumption in Aliabad and other modern villages presented earlier. Possible relationships among settlement population, site area, and sustaining area are evaluated, and some implications for the interpretation of formally comparable unexcavated archaeological data discussed.

In Chapter 6, data pertaining to prehistoric climate and land use in central western Iran are reviewed to establish the time depth of patterns observed today. Although some problems in the literature dealing with paleoenvironmental reconstructions are described and the need for much additional empirical information acknowledged, it is suggested that villagers in the Aliabad area have, for almost six millennia, been adapted to an essentially modern habitat. Some of the archaeological data from this area are reviewed and evaluated in light of the contemporary data presented in the preceding chapters. These data, in conjunction with data on the spatial organization of contemporary villages, are used to argue that closer consideration of archaeological sampling design is required in this area. Finally, Chapter 7 summarizes the major findings of the study, points to problems that it raises but does not necessarily resolve, and suggests some possible avenues of future ethnoarchaeological research.

⁵Functional size refers to the number of different kinds of activities, goods, and services within a settlement; cities are functionally larger than towns, and both are larger than villages.

2

Village Organization and Land Use



Patterns of land use are constrained by a range of environmental variables, and related in complex ways to technology, patterns of settlement, and social organization. A limited group of domesticated plants and animals is intensively utilized throughout Southwest Asia today; archaeological research continues to demonstrate that this group of domesticates has a long history throughout the area. Along with preserved remains of plants and animals, many features of an associated technological complex for the maintenance, processing, storage, and consumption of these resources are incorporated in the archaeological record as both artifacts and structures. Variations in the size of landholdings, and in the composition and size of flocks, are associated with variations in households' productivity and consumption, which in turn are related to household size and composition. Unlike technological items and structures such as stables and food-storage facilities, these intangible aspects of village life do not become archaeological residues. But the structures in which households reside can be located, measured, and compared, and some of the organizational features of their resident populations might be reconstructed or "retrodicted."

This chapter begins with a brief description of Aliabad's environmental setting, introducing those unfamiliar with Southwest Asia to some of the "constraints" within which its food-producing populations operate, and outlining to students

of the area some of the distinctive features of this particular region. This description is followed by an ethnographic sketch of Aliabad's population, intended both to demonstrate that many organizational features of this community are comparable to those reported for other parts of Southwest Asia and to form a backdrop to the more focused discussions that follow. The brief outline of residence patterns and household sizes is pertinent to the description of variations in economic status in Chapter 3 and of Aliabad's architecture in Chapter 4. An account of land use and behavior relating to subsistence provides a frame of reference for the discussion of village land use and settlement patterning in Chapter 5, and of archaeological materials in Chapter 6.

THE ENVIRONMENTAL SETTING

Aliabad is situated about 1500 m above sea level, near Kangavar, in an intermontane valley in the Zagros Mountains of central western Iran (Figure 1.1). In this area today, January is the coldest month, and July–August the warmest period.¹ Annual temperatures range from 4.9 to 37°C (Ganji 1968); in the warmer months, the diurnal temperature range can be considerable. Weather stations at the nearby provincial capitals of Hamadan and Kermanshah have recorded annual precipitation levels at the lower end of the 300–600 mm range characteristic of the central Zagros (Ganji 1968:234; Hesse 1978). Precipitation begins as rain in late fall, sometimes continuing into early May. During the winter months, snow often blocks the passes separating Kangavar from Hamadan and Kermanshah. The summer months are generally without precipitation, but in some years (e.g., 1973) sudden rains wash away portions of the already harvested crop and threaten unharvested stands with mildew. In rare years (e.g., 1975) early summer hailstorms and severe flooding destroy both crops and housing. Because crops are vulnerable to the vagaries of temperature and precipitation, villagers do not view them as reliable or predictable.

Because of the topographic complexity of the central Zagros, and a geographic location between major wind corridors, wind patterns are variable. The Kangavar area, like much of Iran, receives summer winds that often come from the north and northwest (Ganji 1968:241). Although in some villages in western Iran house facades are oriented identically, this is not the case in Aliabad or surrounding villages, and villagers do not perceive the existence of any prevailing wind. Violent windstorms are frequent during the dry summer months; given the thin ground cover, produced largely by deforestation and overgrazing, they contribute

¹Villagers own radios and can obtain newspapers in Kangavar, but most mark the passing of time by the weather. Calendrical dates have little significance in Aliabad; on several occasions I was asked what month (of the Iranian calendrical year) it was, and in a few instances was then asked whether that was the first, second, or third month of summer.

to the ongoing denudation of topsoil, carrying it off in swirling clouds of dust.

In the Hamadan–Kermanshah area, much of the climax vegetation of Irano-Turanian and Mediterranean forest and steppe plants has been cleared over the past few millennia. This inner deforested portion of the Zagros has somewhat less oak, and more plantain, sagebrush, and goosefoot than are found in areas still characterized by climax Zagrosian oak–pistachio woodland (Wright *et al.* 1967:438). The general visual impression is of extensively modified landscapes in which the dominant species are nonarboreal, and in which almost all of the arboreal species are fruit trees or fast-growing members of the willow-poplar group. Trees are often limited to small orchards or groves or to stands along streams and irrigation canals, where they are planted primarily for local consumption as food or use in house construction. Bobek's description (1968:285f.) of the Zagrosian oak forest, the probable climax vegetation of this region, scarcely applies to the vicinity of contemporary Aliabad. It is, however, relevant to reconstructions of climatic changes, which are based partly on comparisons of current climax vegetation with prehistoric botanical assemblages. Some of the published accounts of the recent climax vegetation, and the rather scanty data on prehistoric vegetation and climate in this area, are discussed further in Chapter 6.

Much of the modern vegetation in the Aliabad area is watered solely by precipitation, but many of the economically important cultivated plants are irrigated. In the Hamadan–Kermanshah area, irrigation water is sometimes derived from perennial streams. The Gamas-i Ab and its major tributaries are perennial, but because of the precipitation pattern they carry a much smaller volume during summer months. During the winter, the smaller streams freeze over, preventing fishing, which is done neither frequently nor systematically at other times of the year. For the most part, water for such immediate needs as drinking and washing is taken from wells or *qanats*² to supplement that available from the rivers. In an increasing number of localities in the Hamadan–Kermanshah area, electrically driven pumps provide water both for household use and for agriculture. Aliabad has no electricity or pump, and derives its water from the river, wells, a spring, and an irrigation canal whose water comes from a *qanat* that surfaces upstream. In Aliabad itself, the water table is said to be approximately 6 m below ground surface. No mechanical system of lifting water (such as the *shaduf* or *saqiya*, found elsewhere in Southwest Asia) exists in this area.

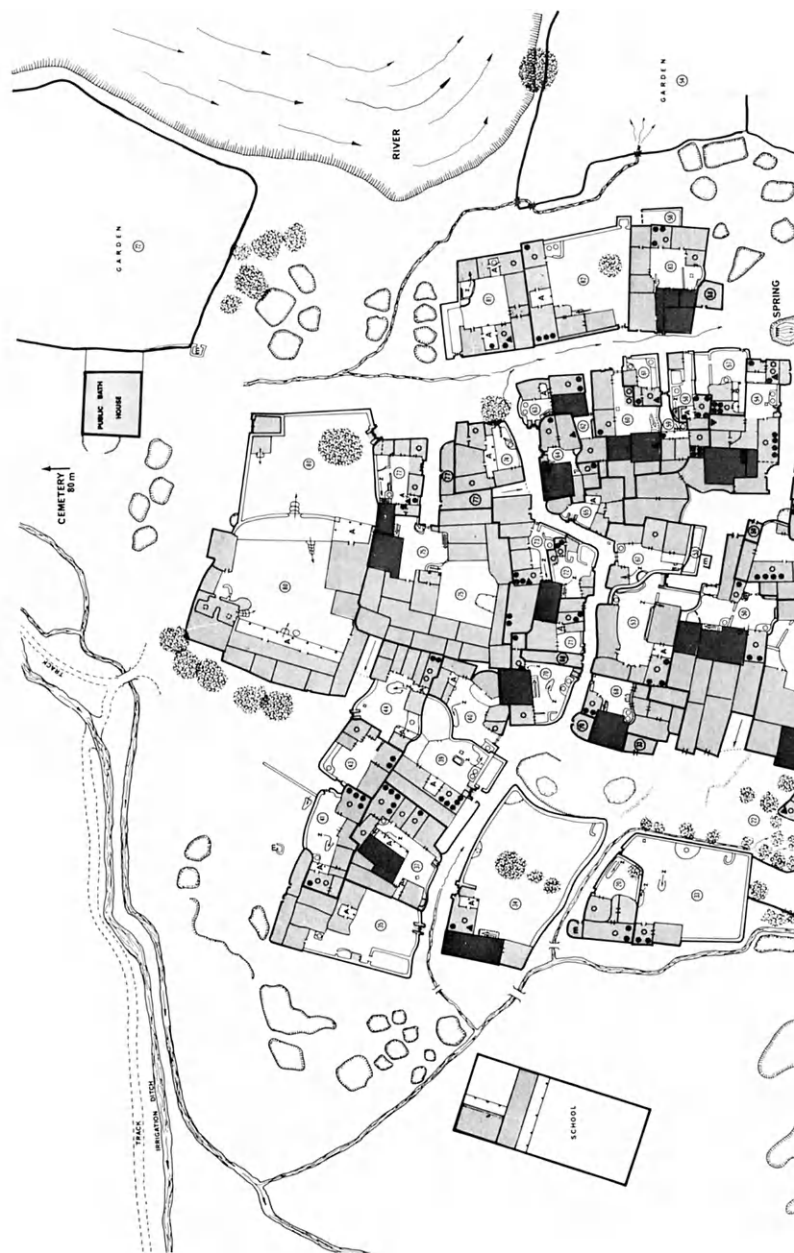
Data on the soils of this region are limited. With the exception of fine-grained alluvial soils (derived from other areas) the soils of the Aliabad area have been characterized as “marginal” for irrigation agriculture (Veenenbos 1959). These

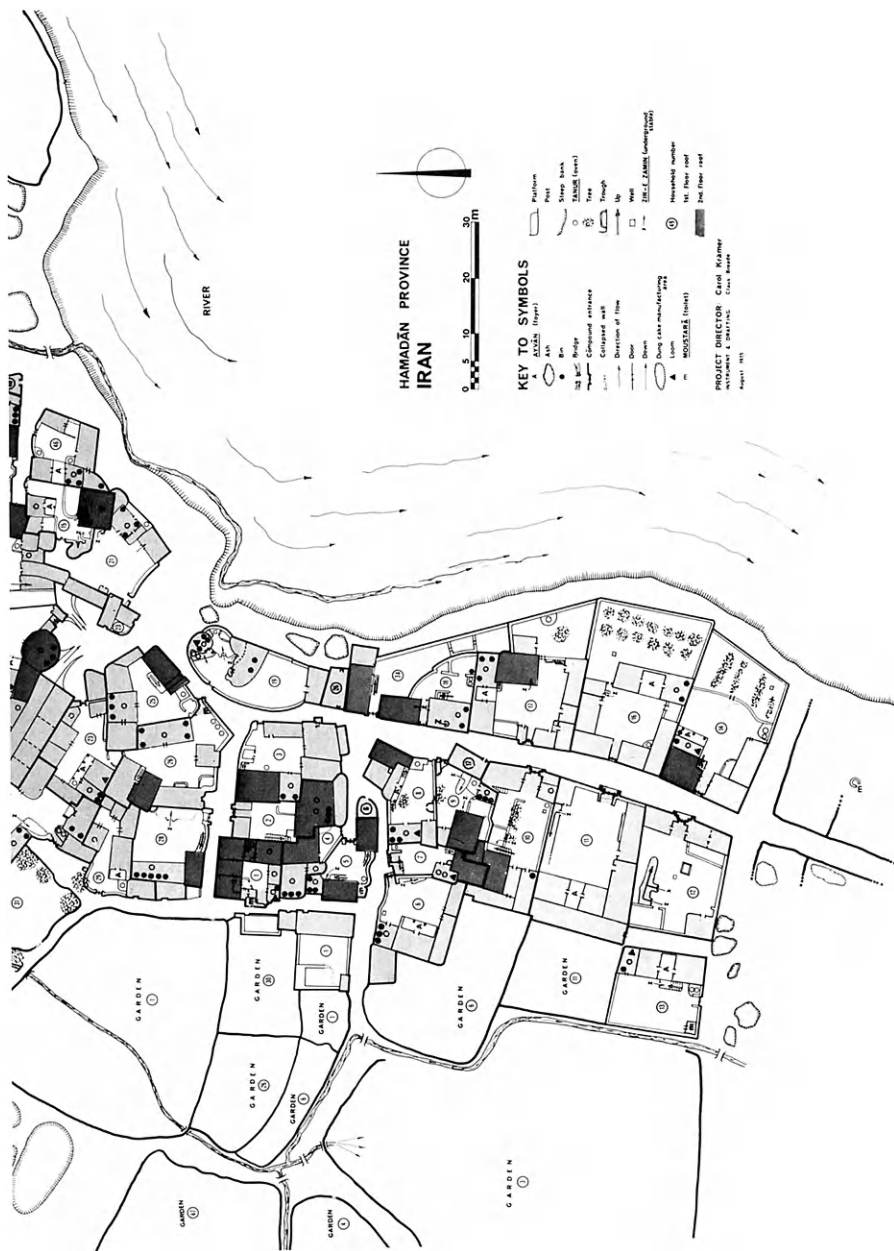
²The *qanat* (known elsewhere as *karez*) is a system involving the draining of aquifers with horizontal subterranean tunnels that lead water to the surface, where the principle of gravity-flow irrigation (utilizing canals) takes over. *Qanat* technology extends back to at least the seventh century B.C., and has been described by English (1966), among others.

brown soils, in terrain with gentle slopes (of 3–5%) are, like lithosols in the Kangavar area, partially derived from underlying calcareous units of the Iranides formations (Dewan and Famouri 1964:24ff.). Because of the uneven topography, control of runoff is a potential problem throughout the Kangavar area; in their characterization of western Iran in general, Dewan and Famouri (1964:272) assert that “erosion is rampant.” In areas with slopes exceeding 3%, gravity-flow irrigation, such as is found near Aliabad, requires careful management to minimize the removal of topsoil with its already limited organic content (Dewan and Famouri 1964:65ff.). Arable land with slopes of 3–8% is said to be best suited for cultivation of close-growing crops, such as the small grains, but can also be used to grow row crops (like beans) if carefully managed. In general, soils in hilly terrain are unsuited for gravity-flow irrigation and, in the Kangavar area, they tend to be dry-farmed to wheat and barley (Dewan and Famouri 1964:65ff.). In addition to the potential for soil erosion inherent in topography and land use practices, the brown soils that characterize the area tend, because of their structure, to suffer moisture deficiency during the warmer months (Dewan and Famouri 1964:15). Moderate salinity and alkalinity may limit the productivity of irrigated land in portions of the territory around Aliabad (Veenenbos 1959). Although the coarse scale and areal focus of soil maps available for central western Iran preclude a more detailed description, it should be noted that when Aliabadi informants were asked if there were any areas in the Hamadan–Kermanshah region that were viewed as having particularly “salty” soils, they said that the region between Asadabad and Hamadan, along the Baghdad–Tehran road, was known for its salinity, and that barley grew at more productive levels than wheat in that area. They discounted the possibility that their own valley was particularly saline, and the crop complex grown there seems to support their view. The local system of food production is described in greater detail following an introduction to the village of Aliabad and its inhabitants.

ALIABAD AND ITS PEOPLE

Aliabad’s houses and gardens cover an area of approximately 3 ha, extending along the bank of the Khorramrud, a tributary of the Gamas-i Ab (Figure 2.1). The river is virtually dry during the hottest summer months and sometimes freezes over in winter. The threshing floor lies opposite the village, across the river, as does a large unroofed and deteriorating mud-brick structure in which animals are penned at night when the river is too high for them to cross safely. The village’s cemetery extends north, and its fields are to the south and west, and across the river. A variety of tracks, irrigation ditches, and several archaeological mounds of varying date are located within the borders of Aliabad’s fields.





Aliabad's livestock often graze on the lower slopes of Khan Gurmaz, which dominates the landscape, rising to a height of almost 2900 m.

Although many of its structures are substantially younger, Aliabad as a settlement is probably at least 100 years old. However, efforts to extend its history much beyond this century proved fruitless. Because of the considerable residential mobility of villagers in this part of Iran, it is unusual to meet people who are sufficiently elderly and who have resided in a particular village long enough to provide an internally consistent village chronology. In Aliabad, efforts to use earthquakes, floods, and recent political events to develop a long and detailed village chronology proved unavailing, and an estimate of its age is based on dates reconstructed for a series of landlords and headmen. Being relatively difficult to reach from both the current paved Baghdad-Tehran highway and its somewhat more southerly predecessor, the Aliabad area appears not to have been included in the itineraries of such intrepid nineteenth-century travelers as Buckingham (1829/1971), nor do most villages in this area appear on pre-World War II maps. It seems likely that the site of Aliabad has shifted slightly since earlier Islamic times; one of the local mounds, several hundred meters from the modern village's periphery, is considered by some of the villagers to be the immediate predecessor of their more recent settlement, although they refer to it by a different name. This mound is littered with relatively undistinguished sherds and is marked by a few heavily eroded but still discernible wall stubs. It is not clear how long it was occupied or when it was abandoned.

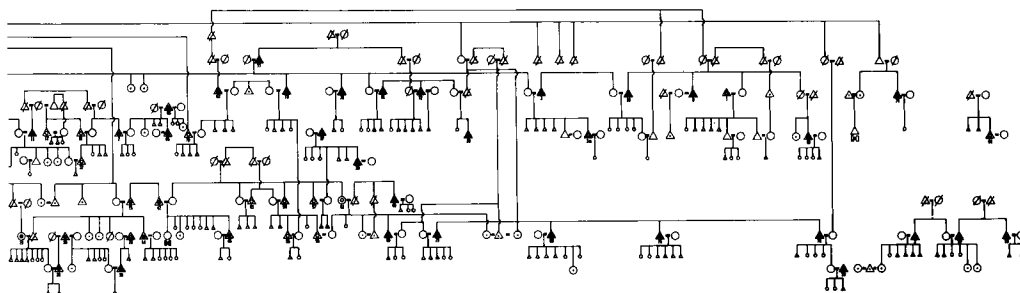
The modern village nearest Aliabad is almost 3 km away; greatest interaction between Aliabad and outsiders occurs with inhabitants of this village, many of whom were either born in Aliabad or are close kin of its residents. Aliabad is approximately 10 km from the nearest paved road; irrigation practices result in frequent flooding of local dirt tracks, rendering them impassable to vehicular traffic, and making it even more difficult to traverse the distance to the paved road. An important recent development was the purchase by a village family of a used truck; beginning in 1974, this decrepit vehicle was used as a bus to transport villagers to Kangavar, the nearest town, for such staples as sugar and tea, and for occasional health care. Not all can afford to buy passage on this vehicle, and the number of trips made to town by any given villager in any given year is said to be small. During the warm months, for example, making this trip once each week seems to be unusual, and travel is reportedly even less frequent during winter. Women and children rarely visit towns or cities. Aliabad's comparative "isolation" should soon change, as a new network of secondary roads under construction in 1975 is completed. All of these roads bypass Aliabad, but one of them cuts through the village nearest it. If the pattern observed nearer Kangavar is repeated here, the completion of these roads should increase the volume of vehicular traffic and hence the mobility of people and the circulation of goods in the area.

Aliabad's population is small (418 during summer 1975). These villagers refer to themselves as Kurds (Arfa 1966) and their first language is Kurdish, an Indo-European tongue related to Persian. Their dialect is perhaps related to Laki, spoken in some villages in neighboring Luristan and Kermanshah provinces (Black-Michaud 1974:227; Watson 1979). As a consequence of their sense of Kurdish identity, it seems, villagers more often visit the Kurdish center of Kermanshah than they do Hamadan, despite the fact that formally they are residents of Hamadan province. Kurdish is widely spoken in Kermanshah city, whereas Persian and Turkish are the languages of Hamadan. Not all Aliabadi men are literate, but most of them less than about 40 years of age can speak Persian (with varying degrees of competence); most women speak only a few words of the Iranian national language.

Although ethnolinguistically they are Kurdish, like many other Iranians the people of Aliabad are also Shi'a Muslims. And like many other Southwest Asian villagers, Aliabadis express a preference for village endogamy, patri-virilocal residence in extended family households, and patrilateral parallel cousin marriage (Figure 2.2). Other forms of cousin marriage and occasional cases of levirate and sister exchange were also recorded. Kin terms in Aliabad are similar to those described by Barth (1953:67ff.) for a "nontribal" village in Iraqi Kurdistan; Aliabadis' terms for cousins and aunts correspond to Murdock's (1965:234) "Sudanese" terminology.

Marriages are arranged by parents and such other close kin as grandparents, aunts and uncles, and older siblings. Once married, a couple generally lives in the house of the groom. A new room or a room formerly used for another purpose (such as food preparation or dry-goods storage) is prepared for the couple, who can, people say, reside indefinitely with the groom's parents and unmarried siblings, with whom they generally pool their resources. If residents perceive their housing arrangement as becoming crowded, or if there are other incentives for fissioning such extended virilocal households, there is a strong tendency for these kin to live as near one another as possible. Aliabad's 67 dwelling units (house compounds) and their resident households, rather than nuclear families or individual inhabitants, are treated as the basic analytic units described and compared in the following pages.³

³Coresiding individuals or households are referred to as *hamsayeh*, or sharers of the same (walls') shadow, whereas neighbors in adjacent compounds are described as *savvah*, "near." The members of a household are collectively referred to as a *khanevadeh*, in contrast to *famil*, which in Aliabad is used with the more restricted meaning of immediate kin (as in nuclear family) or the broader connotation of "relatives." In a few cases, close male kin occupying adjacent compounds (in some cases, formerly a single compound that had been physically subdivided by a wall; see Chapter 4) were referred to by others as *hamsayeh*, when in fact they were now more literally *savvah*. During 1975, when the village census was taken as part of the study discussed here, the procedure used had two stages. In the company of several informants, I compiled a list of households (*khanevadeh*), including their



the Kermanshah–Mahidasht area as recently as the first decade of the twentieth century (Rabino 1920). The correspondence between the tribal names mentioned by Minorsky (1920), Rabino (1920), and Stark (1936) and those of Aliabad's major landowning groups suggests that a pattern observed by Black-Michaud in Luristan may obtain here. He has argued (Black-Michaud 1974:216) that in contrast to most sedentarized pastoral nomads, who drop tribal names and affiliations in a matter of a few generations, "the rare immigrant lineages which achieve high status in their new homes are inclined to retain their foreign or section name as a charter for their status."

The people of Aliabad claim that they have no relationship to any tribe, clan, or lineage, and they consistently draw a sharp distinction between themselves and the seasonally migratory occupants of both black and white tents, nomadic pastoralists and itinerant "tinkers" respectively. Although Aliabadis never move into tents seasonally, this practice was noted farther to the south, during summer months, where some Luri villagers had been forcibly sedentarized several decades ago (Amanolahi-Baharvand 1975; Black-Michaud 1974). Indeed, the inhabitants of Aliabad do not own tents, and appear unfamiliar with tents' layouts and with the location and organization of pastoral nomads' campsites. Villagers say that they would not marry either nomadic inhabitants of black tents or the tinkers in white tents, both of whom pass near Aliabad on an annual basis.⁴ They would also strongly disapprove of a village man's marrying a girl met in Tehran,

⁴Some of these nomads are referred to by Aliabadis as "Turkashvand," clearly the "Turkashwand" referred to by Black-Michaud (1974:224). According to him, they are a Laki-speaking group. Aliabadis, in contrast, admirably describe them as competent speakers of a number of languages—Turkish, Luri, Laki, Farsi (Persian), and Kurdish. Turkashwand and other, Luri-speaking, pastoralists migrate from lowland winter pastures to summer grazing in the vicinity of Hamadan, east of Aliabad. The Turkashwand observed during summer 1975 occupied a small group of black tents for some 10 days; their camp was not too near Aliabad, although apparently in some years it is. A "symbiotic" relationship between agriculturalists and pastoralists in Southwest Asia has been discussed in many publications about the area. One of the forms that this interrelationship takes is the grazing of nomads' livestock on the stubble of harvested fields; the animals' dung is thought to fertilize these fields.

saying that urban women do not know how to bake bread. As recently as 1975, however, villagers working in Tehran had few opportunities to meet marriageable urban women. And, unless urban men had access to land or other property, there would be little reason for them to immigrate to villages like Aliabad.

Household size is affected by patterns of fertility and mortality, practices affecting birth interval, parents' marital ages, demand for household labor, fathers' presence or absence, expectations regarding child mortality, and, to some extent, parents' desire for sons. Villagers in the Aliabad area do not have easy access to increasingly available health care and contraceptives. Use of powdered baby foods like Enfamil, mixed with contaminated water and bottled in unsterilized containers, may contribute to infant mortality. Coupled with moderate conformity to recent government regulations raising minimal marital ages and with apparent increases in seasonal out-migration of men, this may depress the fertility rate, at least in the short term. However, the elderly in Aliabad are dependent on close kin for many forms of material support, and parents appear to anticipate that at least some offspring will die early in life. Thus, established norms regarding both child spacing and household size may not change substantially in this area for some time.

When questioned, several adult villagers, both male and female, indicated that they considered 3 years the most appropriate interval between births. They also indicated that the ideal number of offspring for a couple was "about 6" (see also Ajami 1977:401f.). In the census drawn up in 1975, the maximum number of offspring recorded for any one woman was 11. With the exception of 8 recently married couples and one elderly childless couple (the woman's second marriage; she had had a child by a previous marriage), all village couples have had at least 1 child. The average number of offspring born to these 89 childbearing women was 4.9; the median, 6, corresponds to the stated ideal. Not all of these children had survived to 1975, however. In the group of 39 couples having had 6 or more children, mean juvenile mortality was 29%; it exceeded 40% for 10 of these couples, and in the case of one couple, 6 of 8 children had died early in life. The mortalities in the 439 births recorded in the 1975 census were equally divided between girls and boys; most of them reportedly died in infancy.

Household size in Aliabad ranges from 1 to 15, but only one house in the village has a single resident (an elderly widow) and only one has 15. Some houses have more than 9 residents, being occupied by members of two or more nuclear families (which range in size from 2 to 9 people), and median household size is 6. Variations in household size appear related to differences in their landholdings.

LAND OWNERSHIP

Before the implementation of land reform in the 1960s, Aliabad and the villages in its immediate vicinity were owned by absentee landlords (see

McLachlan 1968). Kermanshahan province, and parts of Hamadan, were traditionally areas in which large numbers of villages were owned by a single landlord; this had also been the pattern in the Aliabad area, where one recent landlord is said to have owned at least 14 villages. In each village, a headman appointed by the landlord represented him (Lambton 1953:190). In Aliabad, tenant farmers generally built their houses but could be moved to other domiciles at the whim of the landlord or headman, particularly if he were inspired by bribes (said to have frequently taken the form of a rug or a sheep) from other tenants desiring particular houses. At least one Aliabadi, having been dispossessed, had moved to and taken up residence in Kangavar, but had returned to the village following the implementation of land reform. Thus, before 1962, tenant farmers did not legally own their own residences, and residential shifts within the village did occur, though frequencies are very difficult to determine. One of the addenda to the 1962 land reform law, implemented in 1964, specified that houses occupied by peasants were to be left in their possession (Lambton 1969:211). Some Aliabadis said that one of the benefits of land reform was the proscription against alienating villagers from their domiciles. In visits to many villages affected by land reform, Lambton observed "great activity by the peasants in building better houses for themselves [1969:348, 362]."

Some informants' accounts suggest that Aliabad in the 1950s and early 1960s may have had a marginally more "enlightened" landlord than did many other villages in western Iran. However, from the point of view of both landlords and village headmen, manipulating the threat of residential shifts and the option to reallocate farmland to tenants must have seemed useful tactics in minimizing the formation of alliances among them, and there is reason to believe that such threats were made and carried out in Aliabad. Residential disruptions within villages were paralleled by movement among them; when a tenant became too indebted, or did not get on well with the landlord or his steward, he moved to another village, also working on a tenant basis. It is for such reasons that a number of the older household heads in Aliabad were not born there, but are immigrants. Some resided and worked in a series of two or three villages in addition to their natal community before settling in this village. Many of the villages from which such men emigrated are readily accessible from Aliabad.

During the early days of implementing the reform bills of 1962 and later years, the government purchased the holdings of landlords in the Aliabad area, and then offered these lands to local inhabitants for sale on an installment basis (Bill 1972; Keddie 1972; Lambton 1969:694). One of the terms of such land sales, which are reflected in the distribution of wealth observed during 1975, is that legal ownership of field lands cannot be transferred, whereas orchards and house lots may be. Installment payments on field lands were to be spread over a 15-year period, during which time titular ownership of land has been frozen. Some villagers who had purchased land on the installment plan indicated during 1975 that they feared that the government would attempt to "purchase" the land from

them as it had from the previous owner (the landlord). Those who do not own land indicate a great desire to purchase some, and are eagerly awaiting the termination of the freeze on transfers, since they are now in a position to make capital investments. (Land transfers were to have been permitted after 1978; it is not clear what effect events following the revolution of 1978–1979 have had on peasants in this area [see MERIP 1980].)

The foregoing indicates that even when the land reforms were put into effect, some villagers were in a position to purchase land and others were not; Keddie (1972:381ff.) notes that most cultivators (i.e., sharecroppers or tenants, constituting 50% of Iran's villagers) did not get land with the 1962 reform. The variation in economic status that exists in Aliabad today also existed during 1962 and earlier, although the distribution of wealth in the village may have changed slightly during the intervening period. It seems, for example, that some households have been able to amass sufficient "wealth" (through cash brought in by sons, through sale of garden plots, and perhaps through marriages that brought in cash) to place them in an economic bracket higher than that of 1962. Perhaps less obvious is that even in 1962 there were some landowning households in the village. As far as could be determined during 1975, many of those who already owned land were kin of the headman (family name D—see Figure 2.2) holding office during 1962. Keddie (1972:394) observes that many landlords rigged allocations during reform to benefit friends and loyal dependents. Members of D households, and another group (M), possibly related to the Luri tribal group referred to above, own the bulk of Aliabad's land, as can be seen in Table 3.4 (see Lambton 1953:272ff.). These and a smaller group seem to constitute *nouveaux riches*, perhaps strengthened rather than created when the option of purchasing land from the government was introduced by the reforms of the 1960s. Although many of these individuals own comparatively small tracts, they are all counted as landowners in the present study.

In 1975, only half of the households in Aliabad owned land, and similar patterns obtained in nearby villages (Young, personal communication). Keddie (1972) has argued that during the early twentieth century, and earlier, there were marked disparities among various groups of peasants; those most favored by the 1960s reforms were those who already held rights to cultivate village land and owned "instruments of production" (including oxen). For the most part, the landowning families have a fairly long history of residence within Aliabad. Presumably, many of them had cultivation rights before 1962. Of the village's 34 landless households, most have a substantially shorter local history, the household heads having been tenants of the former landlord. Thus, although such individuals were residing in Aliabad in the early 1960s, they did not have sufficient capital to purchase land, even on an installment basis.

When most recent landlord visited the area at harvest time, he generally stayed in the headman's house if he was not staying overnight in another of his villages

nearby. The oldest and wealthiest families in Aliabad currently reside in the village's oldest houses. The village plan (Figure 2.1) shows the towers and curvilinear walls surviving from an earlier period when defense may have been a more important consideration than it is today. The village has grown up in quarters, or "blocks," around these older compounds. A number of former tenants, immigrants to Aliabad, live in spatially peripheral blocks (see Chapter 4).

The concentration of land in the hands of a few is by no means peculiar to Aliabad. It is reported elsewhere in Iran (English 1966; Lambton 1953, 1969; Miller 1964; Young, personal communication). The fact that some villagers own land and some do not is presumably reflected in differentiated decision making and behavior, some of which probably has material correlates. For example, such differences presumably affect villagers' decisions about seasonal out-migration (with landless parents hoping for working sons, toward whom they sometimes appear to have a mildly entrepreneurial attitude), residence location, marital alliances, and so forth. The fact that not all households own land also had to be considered in analyzing the economic data collected during 1975 and discussed in Chapter 3.

Although not all of Aliabad's adult males are landowners, almost all are members of households in which at least one male is engaged in agricultural activity. Agriculture and stockbreeding continue to provide the foundation for subsistence in the Zagros area; despite the village's links with a market economy on both the regional and national level, Aliabad is still largely self-sufficient, producing much of its own food, and other plant and animal products, with little salable surplus (see Hooglund 1981).

UTILIZATION OF LAND AND ANIMALS

Analyses of botanical and faunal remains retrieved from archaeological excavations in central western Iran suggest that for many millennia subsistence in this area has centered on the major economic species exploited today (see Chapter 6). Data on contemporary food production and consumption can be useful in investigating such archaeological issues as seasonality of occupation (in excavated sites, from which botanical and zoological remains can be retrieved) and size of settlement population (where estimates of sites' "sustaining areas" can be attempted, and/or where features related to subsistence, such as storage facilities, can be identified). Archaeological excavations often yield artifacts and structures related to the subsistence economy of prehistoric sites (such as sickles, plows, and storage bins) as well as food residues themselves. Limited information on food production and consumption in Aliabad sheds light on individual households' requirements, which vary. The following outline points to some of the key features of the village's subsistence economy.

The major domesticated plants in the Aliabad area today are wheat, barley, chick-peas, beans, and lentils; clover, alfalfa, and many fruits and vegetables are also grown.⁵ The most important and numerous animals are sheep, goats, cattle, and donkeys; horses, chickens, turkeys, ducks, and geese, as well as bees, are utilized in Aliabad and neighboring villages. Livestock are usually led out of the village daily by a few shepherds, to graze on lands surrounding Aliabad. Holdings in land and livestock are discussed in greater detail in Chapter 3.

⁵Among the cultivated plants, by far the most important are wheat and barley (several varieties of each are grown). Villagers also raise several types of beans, as well as chick-peas and lentils, and alfalfa, clover, vetch, and other legumes for fodder, and cucumbers, lettuce, carrots, tomatoes, onions, eggplant, potato, and corn. Fruits grown locally (I saw many but not all of these) reportedly include apricot, pear, peach, cherry, plum, apple, grape, mulberry, quince, and a variety of melons. Walnut and almond trees are also grown. A small group of other arboreal species is valued in house construction and in the making of agricultural tools, and cotton is also grown locally. Villagers claim that tobacco, sugar beet, and rice could be grown here (and that, in the past, rice was), but at present the first two currently require government permits and the last needs more water than is now available. Other crops are of course raised by Aliabadis, but their Latin and/or English names could not be established conclusively (Persian and/or Kurdish names are available, but herbarium specimens were not); this group includes several vegetables, herbs, fodders, fruits, and trees.

In addition to these cultivated species, more than 40 collected (wild) plants are used for a wide range of medicinal, pharmaceutical, and other purposes. Some are eaten as jams and syrups, condiments, and greens; others are used as soap or shampoo, as fodder or graze, and in certain "ritual" applications. Those that I have been able to identify with some degree of certainty include *Althaea* (hollyhock), *Astragalus*, *Cichorium* (chickory), *Echium*, *Egysimum*, *Gypsophila*, *Lallemantia*, *Peganum* (rue; used for protection against the evil eye), *Plantago* (plantain), *Rosa*, and *Viola*. It must be emphasized that this list is far from complete. Many other wild plants were either collected by me or were named by informants (and said to be available at other times of the year); they are not listed here because botanical identifications have not yet been made for my specimens and/or for the Kurdish names of plants of which specimens were unavailable. Interested readers are referred to Hooper and Field (1937) and Wulff (1966). Watson (1979) and Sweet (1960), among others, describe some of the ways in which wild plants are used today by sedentary agriculturalists in the Middle East, and discuss the species involved. Some of the plants not frequently or systematically collected by Aliabadis are nonetheless used intermittently as snack foods by villagers walking along tracks or in fields. Although they are highly seasonal, and the volume they contribute to villagers' diets is probably not great, it may be that these wild plants play a significant nutritional role (see Messer 1979).

Wild animals form a very limited part of the diet of villagers in the Kangavar area. Fish (reportedly of one type, referred to simply as "fish") are caught in the Khorramrud; said to be up to 3 kg in weight, they are taken by hook, basket, and bludgeoning (with sticks). Most insects are not of any apparent interest to villagers, but bees, a major exception, are highly valued. Spiders, scorpions, snakes, tortoises, and lizards are found in the area, but are viewed either with disinterest or with great distaste (snakes, in particular, may be energetically pursued to the death). Apparently, there are few wild mammals left in the Kangavar area, and most of them are either inaccessible (as relict populations on mountain slopes) or are not considered economically useful. Rodents are not discussed, though gerbils seem to abound in the area. Hedgehogs live in the Kangavar region, and are occasionally caught and kept briefly as pets. Rabbits are said to be eaten by some Aliabadis though they are abhorred by others, and foxes, which seem to be fairly abundant and at least occasionally diurnal, are neither eaten nor valued for their furs. Villagers say that there are gazelle, wild sheep, and wild goat in the high mountains; all are described as desirable food resources, but very difficult to obtain.

In addition to the domesticated avian species, a range of birds is present in the Kangavar area for at least part of the year. Among these are the sparrow, rook, partridge, vulture, plover, teal, dove, kite, great bustard, peacock, stork, owl, hobby, kestrel, common quail, little ringed plover, green sandpiper, wood sandpiper, common sandpiper, cuckoo, nightjar, swift, roller, bee-eater, hoopoe, crested lark, gray wagtail, white wagtail, lesser gray shrike, golden oriole, rose-colored starling, starling, magpie, Cetti's warbler, olivaceous warbler, rufous bush robin, Neumayer's rock nuthatch, goldfinch, black-headed bunting, little egret, golden eagle, and hooded crow. Aliabadis use pigeons (some of which nest in village houses), sparrows, rooks, and partridges, for feathers, meat, and/or eggs. The vulture's bones are sometimes used to make flutes. Some birds are hunted with a slingshot; at least one of

The system of land use in Aliabad corresponds in many respects to that described by Barth (1953), Lambton (1953), Leach (1940), Watson (1979), and Wulff (1966). Wheat and barley are cultivated on both dry-farmed and irrigated land, in what villagers describe as an alternate-year fallow system. In a given year, a farmer generally halves his holding and plants one half in crops destined for human consumption. The other half is planted in a fodder crop, such as clover or alfalfa, or left uncultivated. Wheat would only be grown on a particular plot in alternate years, never in two or more consecutive years. During subsequent years, the portion originally allocated to wheat might be planted first in clover, beans, lentils, and/or chick-peas, or left fallow, and then fertilized and replanted with wheat. Lambton (1953:362f.) terms this system "twofold" crop rotation. Rotation and fallowing permit rejuvenation of arable soil, minimize salinization, and provide fodder in the form of wild plant species.

Aliabadis consider themselves neither land-poor nor land-rich, in comparison with their neighbors. They report that when a piece of land is actually left fallow for 1 year, it never stands idle in the following year. In discussing the fallowing system, Aliabadis contrast themselves with nearby villagers with more extensive holdings; in one such village, for example, a 3-year cycle entails the cultivation of cereal crops in the first year, clover, alfalfa, or other fodder in the second, and nothing in the third. In commenting on a similar 3-year cycle in Jordan, Antoun (1972:14) notes that the ability to implement such a schedule, rather than the more prevalent 2-year cycle, is predicated on the ownership of relatively large landholdings. In actuality, although several informants indicated that most Aliabadis rarely leave their fields totally uncultivated, they do not perceive themselves as suffering a shortage of land.

Except for the last month of fall and the three winter months (Table 2.1) agricultural activities are carried out throughout the year. Most farmers use traditional implements; when cash is available, they may use chemical fertilizers in some irrigated fields. When such fertilizers are not employed, fields may be spread with earth quarried from nearby prehistoric sites or from village houses' decaying walls, or with ash. In addition, the droppings of grazing sheep and goats are allowed to stand on fields rather than being collected for use as fuel. Farmers in Aliabad may also rent time from the single tractor in the village; many of them appear not to do so, and some express mixed feelings about the savings in labor (demanded by plowing), the high rental costs, and deterioration of soil considered to result from repeated tractor use. As elsewhere in Iran, the use of tractors might also be unpopular because of the additional labor required to reconstruct irrigation canals after a tractor plowing (English 1966:123). Combines are repor-

Kangavar's carpenters sell slingshots, and villagers also make their own. Information on the avifauna of western Iran is available in Scott *et al.* (1975) and in an unpublished paper by Dennis Power, director of the Santa Barbara Museum of Natural History, who studied birds in the Kangavar area during summer 1969 and very generously provided me with the manuscript (Power n.d.).

TABLE 2.1
Seasonal Cycle, Allabad (A.D. 1975/1354 A.H.)^a

Season	Zemestan (winter)			Bahar (spring)		
Month	Day	Bahman	Esfand	Farvardin	Ordibehesht	Khordad
Dates	23.xii-20.i	21.i-19.ii	20.ii-20.iii	21.iii-20.iv	21.iv-21.v	22.v-21.vi
Crops			← 30.iii-5.iv: Plow, sow (dry-farmed) spring barley, potatoes	30.iv: Sow lentils, chick-peas 20.iv-22.v: Sow beans, follow with other crops ← Weed →	22.v: Sow cotton Plant melons, cucumbers Harvest clover Harvest first alfalfa crop, then chick-peas, lentils 13.vi: Barley	
Animals	← zir-e zamin →		← Sheep and goats born →			← → ← Shear sheep
Water				30.iii: Communal cleaning of village canals	Irrigate wheat twice; irrigate other crops	← →
Fuel						←
Construction						← Beehives, ovens, bins →
Travel						← Migrants →
Social and religious events				21.iii: Iranian New Year (travel, visiting)		
Other						← Felt-maker Reshteh preparation →

^a*Kashk* refers to hand-formed lumps of yogurt, dried to be reconstituted with water in winter; *talkhi-neh*, coarsely crushed wheat mixed with yogurt, also dried out to be reconstituted; *reshteh*, wheat noodles. Dates are those of the Gregorian calendar.

Tabestan (summer)			Pa'iz (fall)		
Tir	Mordad	Shahrivar	Mehr	Aban	Azar
22.vi–22.vii	23.vii–22.viii	23.viii–22.ix	23.ix–22.x	23.x–21.xi	22.xi–22.xii
Harvest legumes, then barley, vetch, followed by wheat, garden crops Harvest beans Harvest alfalfa, wheat (to 10.viii), melons [Rain-fed wheat harvested before irrigated wheat] Thresh (legumes, barley; wheat) harvest —Villagers drink fresh milk Capture wild bees Make <i>kashk</i> Shear lambs Irrigate alfalfa, grapes, melons Collect thistles, other wild plants Dung cake manufacture House construction, remodeling, plastering return for harvest Wash wool visits	Harvest third alfalfa crop, grapes 20.x–15.xi: Plow and sow wheat and fall barley before rains Harvest cotton [Harvest fourth alfalfa crop] Make cheese, butter Roll roof after first rain Pilgrimage Tehran; home visits 'Aid-e Ramadan Weddings Weaving	Make cheese, butter Roll roof after first rain Pilgrimage Tehran; home visits 'Aid-e Ramadan Weddings Weaving	Make cheese, butter Roll roof after first rain Pilgrimage Tehran; home visits 'Aid-e Ramadan Weddings Weaving	Make cheese, butter Roll roof after first rain Pilgrimage Tehran; home visits 'Aid-e Ramadan Weddings Weaving	Make cheese, butter Roll roof after first rain Pilgrimage Tehran; home visits 'Aid-e Ramadan Weddings Weaving

tedly used for harvesting in some other villages in the Kangavar area, but they are not used in Aliabad.

The Middle Eastern agricultural year is sometimes described as beginning in October (Antoun 1972:10f.; Wulff 1966) with the planting of wheat and barley prior to the onset of the heavy winter rains. The people of Aliabad see the annual agricultural cycle as beginning on March 21 with the spring solstice, which marks the Iranian New Year ('Aid-e Noruz). At this time barley and the other major spring crops are sown, the exact timing depending on how warm March has been, and how wet the preceding winter. Most crops are sown broadcast. Plows are drawn by a single team of cattle, as is the harrow (illustrated by Wulff [1966:267]). Irrigation is carried out entirely by means of gravity-flow surface canals, with the distribution of water, a matter of community concern, being tightly scheduled and implemented on an individual basis by each farmer, in his turn, using a shovel to create or destroy miniature dams bordering the canals (Wulff 1966:261). The irrigation water used in Aliabad's fields does not come from the nearby river; rather, it flows downstream from a *qanat* surfacing at the nearest village. At the New Year, landowners in Aliabad spend a day in communal cleaning of the village's main irrigation canal; the year's accumulated silt is thrown to the side of the canal.

At about the end of March, the second barley crop is sown, followed in rapid succession by the planting of lentils, chick-peas, beans, and a wide range of other crops in small quantities. Weeding is carried out in April and May; irrigation, for varying lengths of time and on varying numbers of occasions, depending on the crop, continues through the spring and summer months. The last plants to be sown are eggplant, onions, cucumbers, tomatoes, and a variety of melons. Along with beans, melons are considered the most labor-intensive crops; this is partly because, of the species currently cultivated, they require the greatest amount of water. Antoun (1972:10f.) describes a very similar sequence in the Jordanian village of Kufr al-Ma; there, however, spring crops are apparently not irrigated.

Harvesting begins in June, with barley, alfalfa, clover, and the leguminous vegetables followed by dry-farmed wheat (in July) and irrigated wheat (in August). During most years, the major food and fodder crops have all been harvested and are drying on the threshing floor by mid-August. Threshing is done with a wain-type sledge (Wulff 1966: Figure 381) drawn by oxen and donkeys; the threshed crops are winnowed with wooden forks (purchased, like plow parts and sickles, in Kangavar) and basket sieves (bought from itinerant tinkers). Most of Aliabad's agricultural implements are made of wood and manufactured locally, although not in the village; metal is also used in some other implements and, being more expensive than wood, might be a useful indicator of variation in economic status.

Threshing of legumes is followed first by that of barley and then of wheat, which continues into September. The crops are then weighed and carried back to the village for storage in individual houses. Villagers say that little produce is sold; most of what is changes hands within the village, frequently through barter. Harvested wheat is no longer ground with hand stones,⁶ but is transported to a nearby village where it is ground in a mill and the grinding paid for, usually in cash. Flour is stored in bins of packed mud (*chineh*); barley is stored in bins, in mud-covered straw-lined pits, or in gunnysacks; lentils, chick-peas, and beans are stored in sacks or in small *chineh* bins.⁷ After threshing and prior to storage, the cereal crops are washed (in the river) and sun-dried (on village "commons"). Some wheat is left unground, to be crushed later on hand stones and made into a variety of foods designed for winter consumption. In some nearby villages, small quantities are left unground to be roasted and sometimes salted for use as a snack food; this mode of processing wheat is known but apparently not practiced in Aliabad.

In Aliabad, much of the agricultural work is carried out by men. As in other parts of Iran (Martin 1977), women participate in some agricultural activities, but during the summer, much of their work is done within the village. During the heaviest agricultural periods of summer, when men are often out of the house from dawn until dusk, women work hard at manufacturing dung cakes for the year's fuel, cleaning and spinning wool, and processing milk and newly available agricultural produce for daily consumption and conversion to storable foods that can be reconstituted during the winter months. By harvest time, when women may join in threshing and winnowing, the year's fuel supply has been processed and stored; the same is true of some winter foods, and of wool. Most weddings take place after the harvest, during the period when people are also most likely to make pilgrimages to Meshed or to visit relatives in distant towns.

⁶Grinding stones are still used to crush salt, cereals, and some condiments, dried fruits, and vegetables. There are only three rotary querns in the village (1, 48, 54-56); Hansen (1961:56) reports that not all households in Iraqi Kurdistan have querns. Aliabadis prize fragments of prehistoric querns sometimes scavenged from the surfaces of neighboring mounds. Metal mortars and pestles are used and, in at least one house (47), there is also an (heirloom) wooden mortar. Sweet (1960:56, 130) discusses grinding stones in Tell Toqaan (Syria); they are more abundant there, but are expensive, and differ typologically from those used in Aliabad. Weinstein (1973) briefly discusses grinding stones used until recently in Asvan (Turkey). In Aliabad, stones (river cobbles) are also used to burnish architectural plaster and to sharpen sickle blades; Lee Home (personal communication) reports comparable stone utilization in Baghestan, a village in northeastern Iran.

⁷Storage bins are discussed further in Chapter 4, where it is suggested that they may be useful in estimating household population size. Weinstein (1973) describes food-storage facilities in Asvan, where wheat is commonly stored in mud-plastered wicker baskets, and barley (fodder) in storerooms divided by mud plaster walls into separate bins. Unground wheat is kept in this form of bin in a few Aliabad houses; basketry, although made by one (male) villager (29) and used by all households (most baskets are purchased in towns or from itinerant tinkers), does not seem to be used for food storage except in the most intermittent and short-term way.

TABLE 2.2

Annual Production and Consumption in Four Aliabad Households (1974–1975)

Holdings, production, consumption	Household ^a			
	1 (N = 15)	31/32 (N = 8)	54–56 (N = 11)	48 (N = 7)
Garden	Yes	Yes	Yes	Yes
Fields				
<i>Juft</i>	0	.75	1.00	.83
Hectares	0	5.25	7.00	5.81
Hectares per person	0	.30	.30	.40
Hectares planted ^b	0	2.60	3.50	2.90
Yield				
Kilograms per hectare ^c	0	577	514	574
Kilograms per person ^d	0	125	109	159
Consumption (kilograms per person) ^e				
Wheat	160	180	n.a.	171
Chick-peas	12	6	n.a.	8.6
Lentils	20	6	n.a.	4.3
Beans (various)	3	2.4	n.a.	4.3
Milking livestock ^f				
Cattle	2	2	1	1
Caprovids	20	47	33	24
Milk (kilograms) ^g				
Estimated total	2008	3237	2051	1641
Consumption per person	134	405	186	234

^a Seasonally out-migrating male members (1: 4; 31/32: 2; 48: 1; 54–56: 3) have been counted as year-round consumers (N), which may slightly deflate computed figures for individual consumption. Wheat figures for 48 may be slightly inflated because proportionally more land (in 1975) was planted to cotton and fodders. The abbreviation n.a. indicates that data were not available.

^b Alternate-year fallowing and a *juft* of 7 ha are assumed.

^c Figures are based on the assumption that all field land is planted to wheat. Actually, not all but a large proportion of the land is devoted to that crop. Households vary from year to year as well as from one to another; systematic breakdowns were not obtained.

^d These figures represent computations made by subtracting the “average” yield allocated to seed grain (normally about one-third of the annual yield). “Average” yields were described as 6:1 for irrigated wheat and 3:1 to 5:1 for chick-peas, lentils, and beans. In a good year, wheat yield may be as high as 12:1, but this is said to be rare.

^e Consumption figures were those of the previous year. Wheat consumption must, clearly, involve purchases or barter in some cases. The computations treat all household members as equal consumers, which they are not; if small children were omitted, figures would be slightly higher than those shown. (Watson [1979: 68] reports that in Hasanabad average annual per capita consumption is 243 kg of wheat, but she also notes that consumption varies with age and sex.) Data on consumption of fruit and vegetables were not obtained; mean Iranian per capita consumption of combined pulses and vegetables in 1947 was about 39 kg per year, according to Hadary and Sai (1947: 17). In Asvan, approximately 20 kg of grain legumes are consumed per capita per annum (Hillman 1973a: 229); this settlement is described as unusually productive (Hillman 1973a: 231f.).

^f The number of livestock presumably affects fodder production, not accounted for here. The amount of land devoted to fodder will, in turn, be related to corresponding decreases in wheat production. “Caprovids” refers to sheep and goats.

^g The figures used here (kilograms per year) are based on scattered accounts of milk production in Aliabad and on figures given for Yassihoyuk (METU 1965: 84ff.). One cow is taken to produce about 3 kg per day for 183 days; one caprovid is taken to produce .5 kg per day for 91 days each year. Figures for cattle do not include oxen or calves owned by the households tabulated, whereas juvenile and male caprovids are included (given their small numbers, this should not distort these calculations). Whereas English (1966: 129, 133) reports comparable levels of milk production in the Kerman basin, Hadary and Sai (1949: 18) indicate that average Iranian consumption of milk products was about 89 kg per person three decades ago.

Food production and consumption within Aliabad vary considerably, depending of course not only on the weather, but on whether or not a household owns arable land, on what its members choose to plant (partly a matter of individual taste), on available human and animal labor, on the number of mouths to be fed, and on the number and kind of livestock to be supported. Villagers talk about wheat as if it is the most significant food crop, but the proportions of wheat and other crops sown and consumed appear to vary from household to household, and annually as well. Aspects of four households' uses of the major food crops are shown in Table 2.2; each household also grows fodder (barley, alfalfa, and clover), as well as fruits and vegetables, but the quantities of these crops are reportedly small in comparison with those of wheat and legumes.

Aliabad's lands are divided into those located on the west side of the river flanking it, and those that lie to its east. The fields to the east (approximately one-quarter of the village's holdings of 32 *juft*; see Chapter 3) are all rain-fed; those to the west are irrigated. The water in the river dividing these fields is said to be inadequate for Aliabad's irrigation requirements (and some Aliabadis also describe the river as "belonging" to a small village downstream from their own). Given its seasonal nature, the river would in any case clearly be insufficient for summer irrigation of Aliabad's crops; during summer, when beans and other demanding crops require considerable irrigation, the river is at its lowest, and in some years its bed is almost completely dry.

The landholdings of a given individual are divided into several small plots, distributed on both sides of the river. As in other Zagros villages, one man may have 4 or 5, or even up to 10, noncontiguous plots (Miller 1964; Watson 1979:73ff.). Rather than complaining about this dispersal, villagers describe it as a useful mechanism for distributing soils of variable quality among themselves. This dispersal also probably serves to spread an individual's risks and thereby minimize losses in difficult years. Lambton (1969:350) believes that land reformers' attempts to consolidate dispersed holdings would have met with opposition and hostility. The discontinuous spatial distribution of individuals' holdings may derive from the days of *musha* (a traditional and very widely practiced system of "corporate" land ownership in which fields were periodically redistributed among villagers). Although Aliabadis said that *musha* had been practiced there long ago, their fields are no longer redistributed and could not be transferred between households until 1978 or later. Regardless of their precise location, in most cases the farthest fields owned by an Aliabadi are within a brisk 20-minute walk from home, although one household's most distant fields are as much as 1 hour's walk away. A similar pattern of multiple and dispersed holdings has been described for Asvan (Turkey); there, a farmer's farthest fields are a 2- to 3-hour walk from the village proper, 6 km and farther over uneven terrain (Hillman 1973b:219). Like fields' distances from settlements, which have figured in discussions of site catchment analysis, modern crop yields can be used to develop

provisional guidelines that archaeologists may use in estimating prehistoric population sizes and ranges of productivity (Johnson n.d.; Kowalewski 1980; Kramer 1980). This issue is discussed at greater length in Chapter 5.

In a relatively dry year, yields for wheat (i.e., the ratio of yield to seed grain) may be as low as 1:1 or 2:1; in a very good year, it may reach 10 or even 12 times the amount sown (Antoun 1972:8). Villagers describe such high productivity as unusual, however; average yields are said to be 5 or 6 times the amount sown. These figures correspond closely to those for the Kangavar area in particular and for Hamadan and Kurdistan provinces in general (Lambton 1953:365).⁸ It appears that yields for irrigated as opposed to rain-fed wheat are marginally greater, perhaps up to one or two times more (i.e., 5:1 as compared with 3:1); informants are fairly vague on this point, one stating that there is no difference between rain-fed and irrigated crops' yields. Lambton (1953:364) reports that in many parts of Iran yields for dry-farmed cereals are higher than those for irrigated crops; this may be partially attributable to the fact that the lands on which they are grown are left fallow more often. However, in central western Iran, a "bad" year may occur as often as once in 5 years; in such years crop failure on rain-fed fields can be greater than it is on those that are irrigated (Hillman 1973a:230; Lambton 1953:364). Aliabadis compare the relative productivity of different years in terms of their wheat harvests (normally weighed in October); although some of them consume substantial quantities of legumes, they are markedly less interested in the yields of these crops.

FOOD CONSUMPTION

The productivity of Aliabad's fields is comparable to that of other Middle Eastern regions for which relevant data are available (Table 2.3).⁹ Differences in figures for wheat consumption evident in this table appear to be attributable partly to the fact that, compared with some other regions, relatively larger quantities of beans, lentils, and chick-peas are consumed, and relatively smaller

⁸Lambton (1953:369) reports that the "normal" yield of a *juft* (see Chapter 3) in the Kangavar area is 28 *kharvar* (8400 kg). If a *juft* is 6 ha, this is a mean yield of 1400 kg/ha; if a *juft* is 7 ha, the yield is 1200 kg/ha. Within any villager's holdings, productivity will vary (with edaphic conditions and topography, if for no other reasons), and there may also be slight variations between villagers' holdings. The Aliabad data do not permit a detailed consideration of this issue.

⁹One informant volunteered a hypothetical example of a year's planting: In a total holding of 60 *jarib* (6 ha), 30 will be fallow and 30 sown. Of the 3 ha planted in that year, 2 *kharvar* (600 kg) of wheat and 1 *kharvar* (300 kg) of a combination of barley, beans, peas, and lentils will be planted. From the 2 *kharvar* of wheat, the farmer expects to obtain about 10 *kharvar* in an average year and as little as 3 *kharvar* in a dry year. From the 1 *kharvar* of mixed crops (each of which is planted in a separate plot), the farmer expects to obtain about 3 *kharvar* in a good year. Of an

quantities of other crops (such as rice, dates, and particularly barley, which Aliabadis eat only as a starvation food or in error). In Aliabad, a minimum of about 100 kg of wheat is, apparently, consumed by each person in most years; the average amount eaten by adults is more like 150–200 kg per annum. Black-Michaud reports comparable levels of consumption in Luristan, to the south (1974:221), and Watson (1978:138) found a somewhat higher per capita cereal consumption in a village near Kermanshah. (Comparable quantities of corn and rice, the two other major cereals consumed by the world's population, are eaten in areas where they are the staples [Cook 1972:31; Howells 1960:161; Mayer 1976].) Some 30 years ago, mean per capita consumption of cereal grains (wheat, barley, and rice) was 124 kg per annum in Iran as a whole (Hadary and Sai 1949:17) and today, average per capita wheat consumption is about 150 kg per year (Aresvik 1976:71). Gupta (1968), whose 10-province sample did not include the area discussed here, found a higher consumption of wheat (215 kg per year) in rural areas than in cities (160 kg per year; see note 11). Lambton (1969:192f.) notes that a general rise in the standard of living, such as these figures might imply, was "particularly marked in the improved diet" of inhabitants of villages subject to the 1962 land reform. Despite this possible slight overall increase in annual wheat consumption, it is likely that such consumption varies (though perhaps within narrow limits) according to wealth, with better-off households eating more wheat (and rice) than others (Table 2.2). In discussing contemporary agriculture in India, Gavan and Dixon (1975:50) indicate that calorie and protein intake varies with economic status, such that poorer people consume less. DeWalt and Pelto (1977), DeWalt *et al.* (1980), and Rosenberg (1980) also discuss such variations in diet.

Reliable figures on barley and other fodders produced in Aliabad are not available. During 1974–1975, one landless household spent about half of its earned income to buy fodder for 22 caprovids and 4 cattle.¹⁰ This household

8-*kharvar* wheat yield, the farmer (given a household of five persons) would eat about half. The farmer would thus expect to use in domestic consumption all of the 4 *kharvar* (1200 kg) not used as seed grain, which would be about 240 kg per household member. The same informant later said that for 50 *man* (150 kg) of wheat sown in each half of a holding in alternate years, 3 *kharvar* (900 kg) would be reaped (this second statement assumes a 6:1 yield).

¹⁰In Aliabad, the following figures on (annual) fodder consumption were obtained from one informant (a man owning cattle, sheep, and goats, who stall-fed them to a great extent; the figures are for individual animals): cattle, 5–6 *kharvar* (3 of straw, 2–3 of alfalfa and/or clover); sheep/goat, 1 *kharvar* (5–20 *man* of barley; of the remainder, half is straw, half alfalfa); horse, 7–8 *kharvar* (straw, barley, alfalfa, and clover, in unspecified proportions); donkey, 3 *kharvar* of miscellaneous feed, "plus leftovers." (Note that 1 *man* = 3 kg; 1 *kharvar* = 300 kg) In Yassihoyuk, a Turkish village that appears in many respects to be similar to Aliabad, fodder consumed by sheep amounts to some 12 kg per animal per annum of barley, and 200 kg of straw. In contrast, a bovid consumes a total of 2100 kg of fodder—a ton of straw and 100 kg of barley (METU 1965:82). Hillman (1973a) briefly discusses fodder in Asvan, also in Turkey, and English (1966:118ff.) provides figures for the Kerman area of southern Iran. In purchasing fodder for their livestock, the Aliabad household in question spent a total of 70,000 *rials*; data suggest that in a good

TABLE 2.3
Wheat: Annual Productivity and Consumption^a

Settlement or region	Kilograms per hectare	Ratio of seed to yield ^b	Kilograms per person	Comments	Sources
Aliabad, Iran	500-600	1:4-1:10	120-200	Irrigated	Watson 1978, 1979
Hasanabad, Iran	to 3000	ca. 1:10	300	Maxima are shown	Barth 1953
S. Iraqi Kurdistan	n.a.	1:8	n.a.		Adams 1965
Diyala area, Iraq	1132 ± 25	ca. 1:8	n.a.	Consumption of wheat is relatively low, whereas consumption of barley, rice, and dates is high, in S. Iraq	Adams 1965
S. Jebel Hamrin, Iraq	764	n.a.	n.a.		Zaccagnini 1975
Kirkuk area, Iraq	100-600	n.a.	n.a.	Mean figure	Poyck 1962
Hilla-Diwaniya, Iraq	512-884	1:6-1:11	11.8		Flannery 1969
Khuzistan, Iran	410-615	n.a.	n.a.		Goodell 1975
Khuzistan, Iran	960-1467	1:7-1:13	183-438		Alberts 1963
Davarabad, Iran	1100-1300	1:10	n.a.	Irrigated	M. Martin, personal communication
Baghestan, Iran	1500-3750	1:10-1:25	120-225	Dry-irrigated range; maximum yield 1:50	English 1966
Kerman area, Iran	1050-3091	1:2-1:45	n.a.	Irrigated; mean yield: 1166 kg; mean ratio 1:15-20	

Central Iran	290-360	n.a.	n.a.	Rain-fed	Bowen-Jones 1968
Central Iran	850-1900	n.a.	n.a.	Irrigated	Bowen-Jones 1968
Asvan, Turkey	630-1100	1:11-1:15	320	Dry-irrigated range	Hillman 1973a,b
Yassihoyuk, Turkey	840	n.a.	192-200		METU 1965
Tell Toqaan, Syria	1500-6000	1:15-1:40	n.a.	1 <i>shimbal</i> = 150 kg; 1 <i>fad-daan</i> = 30 ha	Sweet 1960
E. Galilee, Israel	500-1500	n.a.	n.a.	Rain-fed	Zohary 1969
Egypt (1949-1966)	2324.4	n.a.	n.a.	Mean figure, irrigated	Clawson <i>et al.</i> 1971
Israel (1949-1966)	1122.8	n.a.	n.a.	Mean figure	Clawson <i>et al.</i> 1971
Lebanon (1949-1966)	850.6	n.a.	n.a.	Mean figure	Clawson <i>et al.</i> 1971
Jordan (1949-1966)	610.6	n.a.	n.a.	Mean figure	Clawson <i>et al.</i> 1971
Syria (1949-1966)	689	n.a.	n.a.	Mean figure	Clawson <i>et al.</i> 1971
Iraq (1949-1966)	542.8	n.a.	n.a.	Mean figure	Clawson <i>et al.</i> 1971
Saudi Arabia (1949-1966)	1191	n.a.	n.a.	Mean figure	Clawson <i>et al.</i> 1971
Pakistan	810	n.a.	n.a.	Mean figure	Clark and Haswell 1970

^a Figures are for the modern period (cf. Clawson *et al.* 1971). For ancient periods, see Jacobsen and Adams (1958), Maekawa (1974), and Zaccagnini (1975). The conversion figure used here is 1 liter = .67 kg. The abbreviation n.a. indicates data not available.

^b See Lambton (1953:364f.) for additional data on a wide range of Iranian localities. The range given for unirrigated wheat yields is from 3 to 25 times the amount sown, and for irrigated wheat, from 4 to 50 times that sown.

obtains cash through the labor of four migrant males and through the occasional sale of carpets. One reason to allocate capital to fodder purchase is the maintenance of sheep, which produce the wool used in carpets woven by wives of two of the migrant laborers. Members of this household consider it desirable to maintain these animals not only for their wool, but also for their milk products; they grow small quantities of fodder within their garden plots. The household head said that when land transfers are permitted, he will purchase field land and grow additional fodder.

Although much of the diet of Aliabadis and their neighbors consists of vegetable products, they rely on animals not only for traction, but for hair and wool, meat, milk, and dung. Honey, and eggs from a variety of fowl, provide important supplementary nutrients. Meat from village animals is consumed primarily during the winter months, when a household of six or seven may kill and eat one to four sheep and/or goats during a 4-month period. As in the case of cereals, there is limited evidence suggesting that meat consumption varies with economic status, but that it is in no case considerable. Aresvik (1976:81) reports that rural meat consumption is low in Iran, and that in general it varies with income. For a small Syrian village, Sweet has also reported (1960:127) that households' diets vary with economic status. In Aliabad, household 1 reportedly butchered and ate "about one or two" sheep during the winter of 1974-1975 (the household at that time totaled 14), whereas household 31/32 (numbering 8) killed four sheep during the same period.¹¹ These households are both above the village median in wealth; it is likely that households in the lower quartiles consume even less meat. Another indication that meat, although much liked, is rarely eaten, may be reflected in villagers' claims that sheep and goat meat cost the same in Kangavar's butcher shops; the cost of 1 kg of sheep meat is in fact somewhat higher than goat,¹² and it is clearly the meat of choice. Relatively young males

year, the out-migrating men of this household might bring home a combined net income of as much as 120,000 *rials*. When the patriarch of this household was asked what he would do with "excess" capital (over and above the cost of the fields he hopes to purchase), he said that he would (literally) bank it in the expectation of building a house in Kangavar. Under such circumstances, he would either sell his village house or give it to one or two of his sons.

¹¹It was said that one sheep generally fed household 1 (seven adults, two adolescents, four young children, and two infants) for 10-15 days. If a sheep has about 30 kg of meat, this amounts to an average of about one-fifth of a kilogram of meat per person daily over a 2-week period. Simon Davis, who studied animal husbandry in the Kermanshah area in 1978, reports (personal communication) that 4-12 sheep or goats are slaughtered per "family" per year, and that the number killed varies with family wealth. According to Hadary and Sai (1949:18), average annual per capita consumption of meat and fish (exclusive of poultry) was about 10 kg in Iran in 1947, which is close to the figures in Gupta's (1968) sample from 10 Iranian provinces. Aresvik (1976:81) cites a more recent national mean of about 14 kg, but observes that urban meat consumption is approximately 18-20 kg, in contrast to a mean of 6-8 kg in villages. Mayer goes so far as to suggest that it is "*historically inevitable* that as people or societies become wealthier their consumption of animal products increases [1976:20; emphasis mine]." It may be noted parenthetically that Lewis (1970:176) refers to an important annual event in Ethiopia when "leaders are served higher quality food than ordinary people."

¹²During August 1975, 1 kg of sheep (on the bone) cost 150 *rials*, and 1 kg without bone was 170 *rials*. Goat meat with bone sold for 120 *rials* in contrast to 130 *rials* per kilogram of boneless meat. Beef was less costly, at 100

(generally castrated at the age of 1 or 2 months) are butchered when they are between 6 months and 1 or 2 years of age. Beef is eaten primarily when large numbers of people are to be fed simultaneously, such as at a mortuary or religious feast. This is so largely because means of storing meat are limited, although some claim that in the past sun-drying and brine were occasionally used to preserve meat (brine is said to maintain the meat in edible condition for about 1 month), and some know of salting (of fish) but associate this practice with large shops in Tehran. When a sheep is slaughtered within the village, it is generally hung from the rafters of a dry storeroom (the kitchen being deemed inappropriate because it is warm, as well as sooty, which purportedly tends to increase the rate of spoilage); pieces are cut off as required (see Hansen 1961:34). In at least one case observed during the summer, strips of dried meat were suspended on a rope in a far kitchen corner. Payne (1973:301) reports that in Turkey, meat cooked and left in fat will be preserved in edible condition for an entire winter, but provides no further descriptive detail; this practice is apparently not carried out in Aliabad.

Meat is frequently consumed in stews, generally composed largely of other foods, and having only small quantities of meat added to them. It appears likely that substantial proportions of animal protein are derived from chicken and particularly from eggs; villagers eat chicken, duck, turkey, and goose eggs, and a few households also keep pigeons.¹³ Aliabadis are distressed when fowl are accidentally killed, and they are protective toward the small batches of chicks purchased occasionally in towns and raised at home for eventual consumption. Fowl are allowed to wander in and around houses, but at night are penned in special *chineh* structures in village compounds, normally in a courtyard corner. Fish are obtained only occasionally from the river, and although they are eaten, are not discussed with much enthusiasm.

In a hypothetical example provided to illustrate his household's consumption behavior, one individual (I) said that within a 3-day cycle, one day would be marked with a dinner of meatless stew (beans, lentils, or chick-peas being the main component of the sauce), the second might have a main meal with some meat (more likely than not chicken), and the third might involve rice, an expensive and prestigious food. Here, rice is viewed as being in the same category (a

to 120 *rials* per kilogram with bone, and 120 *rials* boneless. These prices represent a government-supported price change made early in the month; the relative costs earlier in the summer, though higher, were comparable. Villagers' assertions that the prices of sheep and goat were the same may have been intended to imply that villagers could choose between them according to individual taste. It is likely that such claims do not reflect ignorance of market prices (about which villagers are generally knowledgeable and which they discuss frequently), but rather are intended to mask economic distinctions implied by consumption of differentially priced foods. Several villagers, in various situations, claimed that all of Aliabad's houses are alike. This study demonstrates that they are not.

¹³In Yassihoyuk, hens produce a maximum of 120 eggs per year (METU 1965:94). There is no evidence to suggest that the productivity of Aliabad's hens is any higher than this. Households seem to have several hens each, even if they own no other poultry or livestock, but the numbers fluctuate.

main course) as meat, rather than the starch to which a meat sauce is added (which, in Iranian cuisine, it also often is).¹⁴ Rice is frequently mixed with spaghetti-like wheat noodles (made during all seasons but winter, because during that period the freshly made noodles cannot be dried on the roof) broken into smaller pieces and fried; these appear (to an outsider) to serve as a rice "stretcher." On one occasion during 1975, when a chicken that cannot have weighed more than 1.5 kg was slaughtered for this household's meal, it fed seven people; a guest was honored by being offered its fried liver. Although not meaty by American standards, Iranian chicken is relatively expensive (see Table 3.3). Informants account for its high price by noting that the internal organs of chickens are particularly delicious, and given the popularity of chicken liver in nearby urban centers, it is possible that the price of a whole chicken in villages is partly a reflection of relative scarcity in the face of high demand. Although consumption of poultry products is still low, it is probably higher than it was 30 years ago, when average net annual per capita consumption throughout Iran was estimated at less than 3 kg (Hadary and Sai 1949:18).

Poultry and mammals are killed by having their throats slit. In one household (owning a flock of about 20 caprovids), the household head has never butchered a sheep, goat, or cow, but has instead relied on a brother-in-law, who also does most of his annual shearing for him. This inexperience in butchering might reflect the household head's feelings about behavior inappropriate to his status, but almost certainly reflects the fact that his animals are maintained primarily for their milk and wool and are more useful alive than dead. When an animal is butchered in Aliabad, meat is usually taken off the bone as needed. Because people enjoy eating marrow, and sometimes use bones in preparing soups, bones are cracked with a metal ax¹⁵ and boiled after the meat has been completely stripped away. The tails of sheep are used to make oil, which is allowed to harden and is used in cooking as well as eaten on bread; like many other perishable foods, this fat is stored in glazed ceramic jars made, like all the village's pottery, elsewhere and imported either by villagers themselves or, on donkeys, by itinerant merchants.¹⁶ Cow gut is sometimes used to mend broken pottery; rennin is

¹⁴As noted above, informants claimed that rice used to be cultivated in the Kangavar area, but that now there is not sufficient water, particularly if farmers wish to grow other water-demanding crops (such as beans and melons). Rice is a very expensive food (120 *rials* per kilogram), and one extremely popular throughout Iran. After land reform, one Iranian villager told Lambton (1969:176): "We've become *khans* [chieftains]; we now eat rice!"

¹⁵Only the long bones of sheep, goats, and cattle are used; the bones are struck at one point only, with a blow perpendicular to the long axis. Some Aliabadis use splinters of cattle bone to make small cosmetic sticks used to apply kohl to the eyes of women and infants. The astragali of sheep are sometimes used as gaming pieces (see Watson 1979:199). Wild(?) goat horn is used by craftsmen in other parts of central western Iran to make knife handles. Such knives, used in carpet manufacture and for slaughtering animals, can be purchased in Hamadan, and are reportedly present in most Aliabad houses. Sweet reports the use of water buffalo horn for knife handles in Tell Toqaan (1960:130).

¹⁶Some pottery is brought by truck to nearby villages, whence Aliabadis obtain it. Most of the pottery in Aliabad appears to originate in Feresfaj, a small industrial village about 20 km away over a very rough road (requiring more



Figure 2.3. Processing milk in goatskin, courtyard of house 1. Kitchen door is at right; ladder leads to roof (see Figure 4.7).

used in cheese production, and most other internal organs are consumed. The liver, heart, and kidneys are spoken of with particular relish, and tongue and ears are eaten, as is sheep (but apparently not cattle) brain. The teeth and mandibles of all species are discarded (and, along with horns, occasionally encountered in village alleys). Skins and intestines are sometimes sold; the intestine is used in manufacturing the wool-fluffing implement used by itinerant specialist felt-makers. In Aliabad, goat skins are kept and tanned for use as milk churns (Figure 2.3). In Luristan, to the south, goat skins are also used as water containers. Goat skin is reportedly also used in the Kangavar area for drums and tambourines, but these are not made in Aliabad. Watson (1979:108ff.) provides a detailed account of butchering and skin bag preparation, and Sweet (1960:106) describes similar butchering techniques and food utilization in a north Syrian village.

than 1 hour's drive). The major ceramic items in Aliabad's houses are a large water jar and a low round tray with glazed interior (see Figures 2.3 and 2.7), though not all houses have the water jar. Storage vessels are widemouthed jars of medium height with interior and some exterior glaze (see Figure 4.10). Porcelain, glass, metal, and plastic are more commonly represented than clay in vessels used for food consumption, preparation, and storage. A few households own very old handmade pots said to be from Serkan (a small town about 32 km from Aliabad; the visiting feltmaker also comes from this area), and some also have heirloom gourds (used for spice storage) of unknown origin.

Disposal of animal bone is almost always a casual affair. Since for 8 or 9 months of the year meat is purchased in pieces (from itinerant butchers traveling on donkeys, "shops" in larger neighboring villages, or butchers in Kangavar), the quantity of bone to be discarded is usually minimal. During the months when the river is high, bones are tossed into it and washed downstream; otherwise, they are left lying about the village's open areas to be scavenged rapidly and dispersed by Aliabad's numerous dogs. On such occasions as weddings and mortuary feasts, when large quantities of fresh bone cannot be readily disposed of, they are buried in pits to prevent concentrations of flies. On one religious occasion each year, animal bone is also reportedly buried in a pit in or near the hosts' compound. Informants were vague about the locations of such pits, saying that in general they were in household courtyards. The little osteological and hence potential archaeological evidence of animals in Aliabad consists of horn cores, mandibular fragments and, rarely, portions of long bones or pelves scattered on the village's open surfaces in apparently random patterns. Weinstein (1973:274) describes slightly different discard practices in a Turkish village.

Some villagers claim that cows continue to produce, at greatly diminished volumes, throughout the six colder months, but in general fresh milk seems to be available on a seasonal basis. Much summer activity is devoted to the preparation of milk products that may be stored for consumption during the months when milk from sheep and goats is unavailable. Such products include butter (made during late summer, and stored, salted, in layers in a metal bowl or a glazed jar), cheese (similarly stored), and a variety of dried forms of yogurt and water-thinned yogurt either alone, as in a small, cakelike solid (also produced elsewhere in Southwest Asia [Hansen 1961:46f., 63; Sweet 1960:103f.]), or combined with other foods (as, for example, watered-down yogurt mixed with crushed wheat, a product that in Iraqi Kurdistan [Hansen 1961:48] is stored in a leather sack after it has been dried in the sun). Months after they are prepared, such foods are reconstituted with water and other ingredients (such as dried fruits and vegetables, condiments, and syrups). Like meat, most of these food items are perishable and seem unlikely to be transformed into archaeological residues.

Wool, in addition to meat and milk, is a significant animal product (Figure 2.4). Sheep are shorn once annually, during the summer, and their wool is cleaned and spun,¹⁷ then woven into pile carpets and flat-weave rugs. Many older village women do not know how to weave pile carpets and continue to use the horizontal loom, in open spaces like courtyards and village alleys, in the production of flat-woven pieces slated for domestic use. In contrast with many other Iranian villages—for example, those in the Kerman area (English

¹⁷Wooden spindles and whorls bought in Serkan or Kermanshah, or from itinerant merchants, are used. Villagers claim never to have seen stone or clay spindle whorls such as have been found in many archaeological contexts in the Zagros. They also report that shape and weight are not critical variables in the spinning of different raw materials (but see Hrones Parsons 1972).



Figure 2.4. Spinning wool with wooden spindles and whorls.

1966)—weaving is carried out on a limited scale. An occasional rug may be sold, but most are said to be used within the village, often being designed for newlyweds' rooms. Pile rugs are made on vertical looms (Figure 2.5); skill in their production is considered a bargaining point in matrimonial negotiations. Lambs' wool is used to provide the itinerant felt-maker with raw materials; this same man makes quilts that are stuffed with cotton purchased in town and sometimes augmented by that grown on a small scale by some villagers. Levine (1977) describes felt manufacture in western Iran, and Sweet (1960:159) reports that itinerant felt-makers and quilt-makers visit villages in north Syria.

The products of goats are viewed by villagers as somewhat less important than those of sheep. Goat hair (shorn in the summer) is used locally in the manufacture of ropes, sacks, and flat-weave rugs. Some Aliabad women also mix it with the clay used to manufacture ovens (see also Sweet 1960:122). Villagers seem to value sheep more highly, for their wool, meat, and milk, but goats are considered more intelligent creatures, and kids are often treated with great affection, being hugged and kissed, and allowed to browse freely on orchard trees and, on occasion to wander through compounds.

Aliabadis insist that the animal products discussed in the preceding pages are not of chief interest to them. Meat, milk, wool, and traction are not, they say, the most important contributions of animals to the local economy; rather, it is



Figure 2.5. Vertical loom.



Figure 2.6. Dung cake manufacture near Aliabad's east edge (garden wall to right).

their dung that is essential. Because the Kangavar area is so heavily deforested, and so intensively cultivated, there is little wood or shrubbery available for fuel. Although a variety of wild plants are collected and used for fuel, they are not considered to contribute substantially to a household's fuel requirements, and were only described after repeated insistent inquiries. Charcoal and kerosene are purchased in village shops or in town; these are not used in bread production, however, and are described as less important than the dung used in producing the food that is, quite literally, the staff of life in Aliabad. Plano-convex cakes made of animal dung mixed with chaff are sun-dried during the rainless summer months (Figure 2.6) and stored (often in special rooms)¹⁸ for use during the remainder of the year. One Aliabad woman characterized dung cakes as "treasure"; another family vehemently asserted that "fuel is more important than milk." One could, they said, always "borrow" milk from a neighbor, but one had to purchase dung cakes. Thus despite the fact that villagers like meat and milk products, and know that animal protein and associated nutrients are essential to good health, the food value of animals is, in their view, less critical than their continuing role in producing bread, eaten at every meal and considered the

¹⁸In a few other villages in the Kangavar area, and in parts of Azerbaijan, I have seen large conical structures composed of neatly piled dung cakes, covered with mud plaster, standing in areas between village houses. The plaster protects the cakes from the elements, and is chipped away during the year as the fuel is used.

single most important food item (Figure 2.7). In describing prestations to needy villagers, and using as an example the elderly widow in 21, several informants emphasized the fact that her neighbors give her dung cakes, implying that this constitutes an act of considerable generosity.

In addition to its sheep and goats, Aliabad has a number of donkeys, cattle, and horses (see Chapter 3). Landless households do not generally have donkeys or oxen and possess only a few of the village's cows. Cattle and horses are considered the most expensive animals to maintain and donkeys, viewed as the most dispensable, cost much less than other animals and eat cheaper fodders. During very cold winters when there is insufficient fodder to stable-feed all livestock and they cannot be permitted to graze, donkeys may be allowed to roam in the empty space beyond the village, where they eventually die and whence their carcasses are scavenged and dispersed by dogs and wolves. Village dogs are allowed to forage for food, and are apparently the chief agent responsible for the dispersal of bones. Dogs are used exclusively for guarding homes; approximately half of Aliabad's households have one dog each, but the wealthiest household in the village has five or six. A few households possess cats, which reportedly eliminate some rodents and thereby presumably diminish the loss of stored grains to such predators.



Figure 2.7. Bread preparation in an Aliabad kitchen (bin to right, beehive set in window to left).

Bees are kept by some households, and many others would like to maintain hives. Honey is highly popular both as a food and as a source of small amounts of cash income.¹⁹ As in Turkey (METU 1965:94) and Syria (Sweet 1960:108), household beekeeping is a minor but productive form of entrepreneurial activity, favored partly because little work is required once a hive is installed but apparently primarily because a valued commodity is obtained without having to feed the bees. Bees and the domestic animals described above were used in formulating measures of households' wealth, and they are discussed further in Chapter 3.

ARCHAEOLOGICAL COMMENT

The villagers of Aliabad utilize a variety of plants and animals. Most of the domesticates have a long history in this region. From an archaeological point of view, the importance of both wild and domesticated plants and animals is that they often leave tangible remains that shed light on economic activities. Aliabad's most important animals would leave little archaeological evidence in the form of bone refuse (which is not abundant, because of consumption patterns, disposal practices, and dispersal processes), but the economically significant fauna might well be represented by dung both in stables and in the form of processed fuel, in wool and hair products, and more indirectly in stables, troughs, pens, coops, and hives.

The vagaries of climate and national (and even international) economics affect the production and hence the cost of fodder. For example, in a very dry year or in a year with late frosts and/or flooding, a fodder crop such as barley, clover, or alfalfa may be destroyed and the market price driven very high (see also Oates and Oates 1976a:113). Or if the government claims prime grain-crop fields for opium or other controlled cash crop cultivation (as it did in some Kangavar area villages during 1973), villagers will redefine their priorities and reformulate their productive strategies. Under such circumstances, villagers may feel unable to support all of their livestock, and will sell animals more readily than they would during more "normal" periods. Thus, a compound may have stables and other structural evidence of having (at some time) housed livestock, but in any given year it may be devoid of animals, or have flocks of different size and composition from most other years. To some extent this kind of problem can be tackled through greater attention to sampling and to careful stratigraphic excavation. The existence of the problem and the range of possibilities would hardly be recognized without field observations illuminating them. It is to be hoped that such observa-

¹⁹In Yassihoyuk (METU 1965:94) a traditional (as opposed to governmentally provided) beehive yields 5–10 kg of honey each year. In Aliabad, hives do not necessarily produce each year. A kilogram of honey sells for 200–500 *rials* in the village, and is somewhat more expensive in towns.

tions will erode normative assumptions about remains of the past and encourage archaeologists to consider new strategies for data collection and interpretation.

In contrast to animals, the likelihood of botanical remains being preserved at a site like Aliabad may be fairly promising, since chaff and presumably occasional leaves, glumes, seeds, and pollens are incorporated in building materials like mud bricks and plaster; grain remains and pollens might be retrieved from storage pits, bins, and jars. The key economic species are also of archaeological interest because their association with such structural features as bins and troughs should not only help archaeologists identify the functions of different rooms within a compound and devise population estimates, but also provisionally to establish variation in the economic status of households. It is to this last question that we now turn.

3

Variation in Economic Status in Village Households



Aliabad is a twentieth-century village integrated in and affected in a variety of ways by national and world economic systems. It is part of a highly stratified society with substantial time depth, and in itself can shed little light on the evolution of such a society. The range of variability in the larger system of which it is part is not reflected in its inhabitants' activities or in the materials and spaces that they use and modify. Nonetheless, behavioral and material disparities exist, and though Aliabad must differ from prehistoric villages in a number of ways, it is instructive to consider some of the tangible reflections of differentiation on this local and comparatively small scale.

Ranked or hierarchical societies have long interested anthropologists. Their development, marked by increasing status differentiation and organizational complexity, has been much discussed by archaeologists (Adams 1966; Isbell and Schreiber 1978; Sanders and Webster 1978; van der Leeuw 1982; Wright and Johnson 1975, among others). In delineating processes involved in the evolution of such systems, archaeologists require material evidence of variations in rank to identify differentiation within individual communities, to compare contemporaneous communities, and to evaluate changes over time.

To be most effective in facilitating systematic comparisons, such evidence should not only be preserved as archaeological residues, but should occur in a

wide range of contexts. Because such data are often preserved, and vary in form, quantity, and spatial distribution, archaeologists have utilized mortuary remains (e.g., L. R. Binford 1971; S. R. Binford 1968b; Brown 1971; Wright 1978), exotic materials (G. Wright 1974; H. Wright 1972) and, to a lesser extent, architecture (Peebles and Kus 1977; Watson 1978) to evaluate differences in rank. The underlying assumption in these and similar efforts appears to be that variability in archaeological remains and their distributions is related to variability in behavior, relationships, and statuses in the prehistoric societies investigated.

Unfortunately for archaeologists, material and locational correlates of economic variations are rarely systematically discussed in the anthropological literature (Laumann and House [1970] describe a sociological analysis), and there have been few ethnoarchaeological investigations of these relationships. In contemporary Southwest Asian villages, variation in rank appears to be based on differential access to and control of the means of production. Most often, these are land and livestock. Where water is scarce, access to it may vary with economic rank; in some areas, it is auctioned (Grandmaison 1980:100). This chapter reviews some of the aspects of variation in "wealth" that have been treated in the ethnographic literature, outlines the method used to rank Aliabad's households along economic lines, and concludes with a consideration of some of the relationships between contemporary economic variation and material correlates that seem likely to be preserved archaeologically.

WEALTH AND MATERIAL CULTURE

In ethnographic evaluations of variation in "wealth," distinctions are sometimes made between wealth and prestige (Cancian [1965] has discussed this issue in some detail). High-status individuals do not necessarily possess great quantities of the material items that are culturally defined as markers of wealth. For example, distinctions of wealth among secular members of a community need not also be found among members of its religious hierarchy, in which membership, nonetheless, might be universally viewed as prestigious. Wealth may consist of special skills, or of the control of esoteric knowledge; it may consist of such unused but potentially exploitable resources as minerals or fallow land. The relationship between economic and social status may be further complicated by distinctions between "old" and "new" wealth. Members of an "old" wealthy class may have less capital or other forms of readily convertible wealth than have *nouveaux riches*, yet their group affiliation might confer higher prestige. In discussing Turkish villages, for example, Stirling notes that the wealth of landowners is considered reliable and permanent, in contrast to wealth in the form of

cash earned by migrant laborers (1965:225f.). Migrant workers often possess more ostentatious material goods (e.g., watches, pressure lamps) than other villagers, but they nonetheless rank lower in the prestige scale because their incomes are viewed as transitory and unreliable, and not comparable to those of village landowners. Migrant laborers also do not readily expend their cash on the "nebulous commodity of neighbourly obligation," whereas landowners build influence by "judicious giving" (Stirling 1965:226). Because of variation in all forms of income, Stirling concluded that it is impossible to rank villagers in terms of their income. Lapidus arrived at a similar conclusion in his analysis of medieval Middle Eastern cities, observing that different criteria used (at that period) to evaluate individuals' wealth, power, and prestige "introduced an ambiguity into status rankings" (1967:81). Other anthropologists, historians, and sociologists have commented on the complexity of the relationship between economic rank and social status, but some of them have been more adventurous in developing systems for ranking members of the populations they studied. Some also comment parenthetically on aspects of the material correlates of variation in economic rank.

In discussing wealth in Davarabad, a village on the Iranian plateau, Alberts notes that it is the "cardinal requisite of authority." He argues that since "the material-technical base of local society remains largely undiversified and underdeveloped beyond agriculture and animal husbandry, wealth, and hence high status, proceeds from control of the land [1963:732; see also Peters 1968:176f.]." When asked what they would do if given a gift of money, Alberts' informants responded that they would purchase a piece of good land. In order to rank people in Davarabad, Alberts conducted an experiment reminiscent of that carried out by Tax; he had a group of local informants do their own ranking (1963:775ff.). Those ranked highest were the biggest landowners.

Similar attitudes toward property had previously been reported for the western hemisphere. In his classic study of Panajachel, a highland Guatemalan community, Tax (1953) independently ranked village households, then had two villagers construct a separate rank order of the same sample. In his own ranking Tax utilized land, animals, fruit trees, houses, utensils, furnishings, and nonagricultural occupations. There was substantial agreement between his own and the natives' ranks (Tax 1953:Appendix 3), and in both cases, the landless households were ranked lowest. In a discussion of another settlement in highland Guatemala, Farber (1978) shows that size of landholding continues to be positively associated with rank in this area, and that economic rank is positively associated with behavioral variability, some of it having material correlates in villagers' houses. Where differences in holdings in livestock, rather than land, underlie distinctions of wealth, the same may be true. For example, among the Kababish nomads of Sudan, only the tribal leader and a few other sheikhs are

"individually rich"; although basic tent construction is always the same, variations in size and quality of tents are said to reflect households' relative prosperity (Verity 1971:30).

Some anthropologists have commented on an absence of marked differences in material reflections of variation in rank. Among the Yoruk pastoralists of eastern Turkey, variations in wealth (which may be measured by differences in herd size) are not readily discernible either in dietary differences or in the quality of tents' furnishings or other items of material culture (Bates 1973:161). Rather, increased wealth is more clearly related to prestige, expressed in the acquisition of additional wives (also described by Miller [1964] for an Iranian village) and expenditures on hospitality and charity. Wealthier men also "interact with kinsmen in a preferential way" (Bates 1973:168). Wealth, therefore, can be used to parlay power, partly by developing dependent and obligated constituencies and increased followings. Although it has yet to be demonstrated, it is possible that fewer material correlates of economic variation exist (or that they are less readily observed) among pastoralists than among sedentary agriculturalists; pastoralists may find it expedient to minimize the number of items requiring frequent packing and transportation. Further, if seasonal labor out-migration occurs less frequently among pastoral nomads than among villagers, it may be that they will tend to have less cash and fewer of the esoteric items that seasonally migratory laborers bring home from large centers.¹

Clear economic differences exist among traditionally pastoral Yomut Turkmen of northeastern Iran (Irons 1975). Like Bates and Tax, Irons ranked households in terms of their holdings in land and animals. Noting that Yomut themselves use sheep as the standard measure for other forms of wealth (1975:160), Irons converted land and livestock holdings to their equivalent value in sheep in order to rank the households in his sample.² Given more money, Yomut, like Davarabadis, would use a portion of it to acquire livestock or land; as was noted above, people in Aliabad express a similar attitude, hoping that they can convert cash acquired by migrant laborers to land when the freeze on land transactions expires. Similar attitudes toward land and livestock must be prevalent throughout rural Southwest Asia. In this area, an egalitarian Islamic ideology coexists with an economic system characterized by vertical differentiation. This may be one factor underlying some reports of comparatively minimal differences in social status being associated with "considerable economic differentiation" (Antoun 1972:25). Even where there are economic differences

¹It is also possible that more marked differentiation in rank, and correspondingly more diversified material culture, are likely to develop in agrarian than in pastoralist societies.

²Lambton (1953:142) discusses tribal tax assessments on livestock, similarly listing assessments in terms of animal measures. In view of the positive attitudes of Aliabadis and the people of Yassihoyuk and other Southwest Asian villages toward bees and honey, it may be noted that these assessments included holdings in bees.

among households, it is sometimes the case that "differentials in signs of affluence are few" (Sweet 1960:227).

Relatively insubstantial variation in markers of status differentiation, even where differences in economic rank exist, has also been commented on by some Africanists. Netting, who utilized domesticated animals and cereal crops to develop an index with which he could compare different Kofyar villages (1968:93ff.), states that it is not easy to become markedly more wealthy than one's fellow villagers. However, he notes that there are differences in number of wives as well as in land and livestock holdings (1968:185). It is not clear whether variability in animals and landholdings is reflected in morphological differences within and among the villages he studied.

Bohannon and Bohannon (1968:225) note that among the Tiv, another Nigerian group, wealth "is measured by number of dependents, by industry, and by prestige. In Tiv economy, the control of resources or of capital cannot be made the basis of differentiation and rank. Clientage, tribute, and hoarding of goods are absent." Nonetheless, they indicate that a man's livestock holdings are to some extent a useful measure of his relative wealth (Bohannon and Bohannon 1968:121ff.). Variation in livestock holdings may be reflected in differentiated stabling facilities and perhaps in other items of material culture related to the maintenance of animals. Despite their disclaimer, it is noteworthy that these authors comment (1968:223) that men of "political importance" are generally men of "substantial subsistence means who have large compounds." In Cameroon, "wealth and ascribed status of the slave-owners was expressed in their larger compounds [David 1971:126]" and, as Chapter 4 demonstrates, larger compounds are associated with relatively high economic rank in Aliabad and elsewhere.

Positive associations are said to exist between a Tiv man's "wealth and influence" and "the size of his family and the number of his dependents. More dependents mean more labor; more labor means more farms [Bohannon and Bohannon 1968:121f.]." Elsewhere in Nigeria, bigger and better-built Kanuri houses shelter more dependents and clients, and they are considered signs of wealth (Cohen 1970:260); in Algerian oases, a man's wealth is expressed in the number of wives he has as well as in livestock. Further, if "your wealth increases you will build more rooms or enclose more courtyards, but they will be built the same way and look the same as every other house in every other oasis [Etherton 1971:174]." Among both the Yoruk of Turkey and Yomut of Iran, there are strong positive correlations between wealth (in livestock) and household size. A marked association between household income and household size is also apparent in the data from Yassihoyuk, a rural mixed-farming village in central Turkey (Table 3.1), and family size increases with wealth in a sample of villages in southwest Iran (Ajami 1969, 1977).

The foregoing indicates that qualitative distinctions can sometimes be made between wealth, prestige, and authority, which may be interrelated in complex ways (Peters 1972). In Aliabad and throughout Iran, this distinction was clearly evident even in 1975 in deferential behavior toward members of the clergy and *sayyids* (putative descendants of the prophet Muhammad), who are sometimes quite "poor." Aliabadis admire people whom they describe as "good," and those to whom they refer as *zareng* (clever); such individuals, however, need not be wealthy. In rural Southwest Asia, despite the existence of a money economy, wealth is still largely thought of in terms of the traditional means of production, land and livestock. The ethnographic literature for this and other geographic areas contains indications that economic variation does exist on the community level, and that although comparatively greater wealth may be reflected in material culture, such tangible differentiation is not always marked or immediately obvious to outsiders. Wealth is used to increase the number of dependents and to "bank" the obligations of others, creating a web of dependency and clientage (Peters 1963). Some dependents may be family members; wealth is often converted to brides in traditionally polygynous societies of both Africa and Southwest Asia. Additional wives not only contribute to household labor, but can serve to increase the number of offspring who are, in their turn, added to the labor force. Large households can be useful when laborers are required to tend both livestock and land, and control of such resources permits the support of more dependents (Goody 1972:26f.). Although the "demand for labor" has figured in some discussions of population increase thought to be related to the development of early agricultural systems and other fundamental economic transformations (Blanton 1975; Dumond 1975), variations in household size as they may relate to economic variation on the synchronic level, rather than over the long term, are not often treated in the archaeological literature.

In the following discussion, "wealth" refers to an economic state entailing comparatively large property holdings accompanied by possession of material items which are not uniformly distributed throughout a community or population. Wealth may be associated with prestige and/or authority, but this association is not assumed to be invariable or universal. Prestige, at least in the geographic area discussed here, is not assumed to be associated with material markers of comparatively greater wealth. In Aliabad, the chief government representative in 1975 was the wealthiest householder, and might thus also be viewed as having power or authority. However, the behavior and statements of other villagers suggest that he is not universally respected and admired, and hence would probably not rank highest on a prestige scale, if one could be devised. For the most part, therefore, the following discussion focuses on wealth and its material correlates rather than on social or political status or community opinion.

There appear to be comparatively few attempts in the ethnographic literature to systematically specify relationships between economic variation and material

culture. However, such associations have been reported or intimated in several publications, and seem to exist even on the small-scale local level. For example, among the Tiv, men of political importance have substantial means and reside in larger compounds, and in the Guatemalan highlands material differences among households reportedly parallel variation in economic rank. Differential ownership of imported portable goods may reflect variations in economic rank, but as in Turkey they may also reflect control of cash, as opposed to land and livestock, as well as differential access to certain kinds of markets. Portable goods have the additional and vexing property of being movable, losable, and curatable, and hence may not always be found archaeologically in the same contexts in which they tend to be observed ethnographically. Formal variability in some classes of portable objects may be more directly related to group affiliation than to economic rank (Longacre 1970a; Wobst 1977). Finally, morphological and quantitative variations in material items which do reflect differences in wealth among community members may be limited in scale (Antoun 1972; Bates 1973; Sweet 1960), perhaps serving the useful function of minimizing status differences and the potential for community conflict and underscoring, if not actually enhancing, neighborliness and *esprit de corps*.³

The preceding discussion suggests that relatively greater wealth may be associated both with larger households and with some material items that might be incorporated in the archaeological record. Among sedentary food-producing groups, one such material marker is the domicile, required not only to shelter households of varying size and composition, but also in some societies to house livestock and enclose food-storage facilities. Since residential structures occupy land, and since land generally has a value, a relatively larger compound may reflect the greater buying power of its inhabitants. It may also reflect comparatively greater expenditures on building materials. They are not necessarily of concern to ethnographers, but such questions interest archaeologists, who often expose structural remains.

WEALTH IN ALIABAD

The outsider visiting Aliabad for the first time is unlikely to discern substantial differences among its inhabitants. For example, there is no marked variation in

³The anthropological consensus seems to be that economic variations exist in traditional, nonindustrial societies, but the range from lowest to highest rank within such societies may be slight in comparison with variations observable in contemporary industrialized nations. Perhaps such apparent variations in the order of magnitude of economic differentiation postdate the development of complex state systems, the alienation of some members of the populace from the means of production, and the traditional societies' integration in an international monetary economy. Inspection of the Yassihoyuk data demonstrates that although the range of variation in actual monetary value of households is not great, houses nonetheless reflect in very tangible ways the variation in economic rank of their occupants (METU 1965:17, 40f.; see also Table 3.1).



Figure 3.1. View of Aliabad from the northeast, early summer (river bed in foreground).

villagers' clothing, or among their houses, in terms of building materials, size, layout, or decoration. Indeed, material cues of status differentiation appear at first to be limited and fairly subtle (Wobst 1977). Just as villagers are dressed in essentially the same costume (differences appearing at first to reflect variation in age and sex more than anything else), all houses appear to be virtually identical. With more extended observation, however, variations become increasingly apparent, and can be seen to some extent in people's attire, as well as in the food offered to guests, in households' furnishings, and in houses' building materials, sizes, and layouts. Some of this variability is related to differences in economic rank,⁴ and not all of it will be preserved in the archaeological record.

As was noted above, Aliabad is some distance from any paved or heavily traveled road; villagers report that it produces very little "surplus" food and is largely self-sufficient. In this sense, Aliabad may be classed as "traditional," along with such settlements as Davarabad (Alberts 1963), Hasanabad (Watson 1966, 1978, 1979), and Hosseinabad (Miller 1964). It seems, in a first brief and casual visit, that all households own animals, since even those without livestock often have pens and/or stables. After a longer stay in the village, it becomes clear

⁴A similar (but undocumented) claim is made for Hosseinabad, located about 150 km northeast of Aliabad (Miller 1964:483).

that even though many villagers speak knowledgeably about subsistence resources, technology, farming and food-processing methods, and market prices of food, as well as about earlier relationships between farmers and landlords, many Aliabadis have never owned land, and some do not own livestock. The houses of those without land or animals may lack both portable items and structural features associated with both their maintenance and the processing and storage of their products.

The locations of households referred to in the following discussion are shown in Figure 2.1, and their composition and relationships are indicated in Figure 2.2. The distribution of landholdings and livestock in Aliabad (Tables 3.3 and 3.4) strongly resembles those described for Yassihoyuk, a small Turkish village (Table 3.1), for Kufr al-Ma, a somewhat larger Jordanian settlement (Antoun 1972:31ff.), for a Lebanese village (Peters 1963:171), for the Syrian village of Tell Toqaan (Sweet 1960), and for Hosseinabad, nearer Aliabad (Miller 1964). In these settlements, and in Aliabad, a small group of landowners controls substantial portions of these forms of property.

Ownership of property, however, is not always a clear-cut matter. Because Aliabad's households were ranked on the basis of property holdings, some of the complexity of this issue should be indicated at the outset. For one thing, several Aliabad households have been tabulated as not owning land (since, during 1975,

TABLE 3.1
Economic Variation in Yassihoyuk, Turkey^a

Item	Income group			
	1	2	3	4
Income	1,800– 5,500	6,000– 9,999	10,000–14,999	15,000–60,000
Number of families	21	21	15	18
Family size, $\bar{X}$	3.7	4.5	4.7	6.3
Percentage landless	15.0 ^b	3.9	1.3	2.7
Hectares owned	124	327	272	650
Percentage of village arable	8.3	21.2	18.1	43.4
Hectares per family, range	0–19	0–56	0–24	0–90
Hectares per family, $\bar{X}$	5.9	15.6	18.1	36.1
Hectares per person, $\bar{X}^c$	1.6	3.5	3.9	5.7
Sheep	148	453	436	1317
Goats	9	8	5	349
Cattle	7	19	33.6	47.4
Horses	4	11	26	21

^a Data from METU 1965. The four income groups are defined in that publication. Income is in Turkish *lira*; figures indicate the range (mean and median figures are not provided by METU).

^b Of this group, most are young men living apart from their fathers but working on the father's land.

^c Figures include land in fallow.

they did not), but they are likely, through inheritance or eventual division of a shared patrimony, to become landowners in the future. These households can be distinguished from those which have no immediate kin owning land in Aliabad but hope to purchase land with cash during the coming years. For example, households 3*a* and 14 are likely to inherit at least a portion of the land now described as belonging to households 3 and 15, respectively. At present, the members of 3*a* do not reside in Aliabad, although they reportedly plan to return in the near future, and their compound stands unused but maintained pending their return. The head of 14 works a portion of the land of his father (15), and apparently also consumes a share of its products. The immigrant head of household 13 may eventually obtain (through his wife) some of the land owned by his father-in-law (23) but, if he does, his share will probably be smaller than the inheritances of his two brothers-in-law. In contrast, the immigrant head of household 1 has (except for his sons) no agnatic kin in the village, and no possibility of inheriting land; he hopes to purchase land with cash earned by his seasonally out-migrating sons.

Another example of the complexity of property ownership is a case in which three brothers (48, 49, and 82) reside separately but share a single patrimony. Because they head separate households and are all universally perceived as landowners, their holding has been treated, for analytic purposes, as though they all had equal shares. In the case of the joint household 50–52, the heads of 50 and 51 are landowners, sharing their patrimony; their brother-in-law (52) is a landless immigrant. However, he shares ownership of the village “bus” with one of his brothers-in-law. These individuals, like the landholding brothers in 22/24, were recorded as one (landholding) household because they coreside in a single compound.

There are two cases of landless households in which it is clear that members partake of the productive property of related landowning households. In the first, the house of a widow (61) and her unmarried adolescent daughter is adjacent to that of her comparatively affluent son (60). He owns land, but they both say she does not, despite the fact that since his (deceased) father was an immigrant his landholding may have originated as his mother’s dowry. In the second such case, the members of household 39 (composed of two widows and two adolescents: a grandmother, her daughter, and her two grandchildren) do not own land; they have access to produce of the lands of 79/80, however, and it is likely that the adolescent male member of 39 will eventually inherit a portion (perhaps small) of his uncles’ land unless he emigrates. That such migration is possible is illustrated by household 62, two recently orphaned sisters and their brother, who was considered by other villagers to have become the household’s head. This small family of adolescents, although nieces and nephew of another wealthy household (22/24), was described as owning no land, and moved to Kangavar during 1974 following their parents’ death. Their house, in a state of considerable disrepair,

was purchased in 1975 by an adjacent household (63; it was originally structurally part of 64). This household head was apparently not considered a worthy "welfare case" like 39 (whose adolescent male household head is also a nephew of two very wealthy men), perhaps because his deceased father was generally viewed as aberrant and socially embarrassing.

Those households not owning or sharing land obtain food by sending adolescent and adult male members to work for cash in Tehran on a seasonal basis, as unskilled laborers (generally in the construction industry), and/or by working on a sharecropping or intermittent land-rental basis for other Aliabadis or for residents of neighboring villages. Although some members of the village participate more directly in the national cash economy than do others, they must nonetheless convert a substantial portion of that cash into rent and food in Tehran, into commutation fares, and into comestibles and other necessities in Aliabad. In a discussion of labor migration in Jordan, Antoun notes that in Kufr al-Ma the fundamental cause of migration is land "shortage," and that the migrants who stay away longest are those with little or no land (1972:29ff.).

In Aliabad there is also an association between land and out-migration. Table 3.2, which shows the relationships between migrant labor and ownership of land, merits brief comment. The comparatively large number of landowning households with migrant laborers can be attributed to the fact that half of these ($N = 7$) are younger unmarried men working at least in part to accumulate a brideprice.⁵ Of the nine cases in the group of landless households (lower right cell) that send no men to work on a seasonal basis, one (70) presumably draws income from its share in the ownership of one of Aliabad's "shops" (40). Two of the others (2 and 5) are headed by *sayyids* (putative descendants of the prophet); each of them farms other villagers' land on a sharecrop or rental basis, supplementing this "income" in produce with doles from other Aliabadis (some of whom expressed mild resentment during private discussions of the *sayyids'* incomes). The head of household 10 also does sharecropping (generally in another village, but occasionally on land belonging to Aliabadis). The head of 4 is a musician who obtains income by performing at weddings and other social functions; he also owns a motorcycle on which he rents passage.⁶ The occupant of 21 is a widow, with no relatives in the village; she is its clearest "welfare case." Her son, living in another village, reportedly provides her with some additional material support. She may obtain some food, fuel, or income through the sale of noodles, which she occasionally makes with a small portable machine. Household 39, though landless, has access to essentials through 79/80; 61 has no resident males and is supported by 60 and to some extent by the occasional sale

⁵Brideprice ranged (in 1975) from 40,000 to 50,000 *rials*, and has reportedly increased dramatically over the past two decades.

⁶Protection of this property is, presumably, the reason that compound 4 houses a dog, since in most other cases dogs are found in houses whose residents own land and/or livestock.

TABLE 3.2

Land Ownership and Migrant Labor in Aliabad, 1975^{a,b}

		Land	
		+	-
Migrant labor	+	11, 12, 17, 25, 26/27, 31/32, 35/36, 44/45, 46, 48, 54-56, 65/66, 73, 83	1, 3a, 7, 8, 9, 13, 14, 16, 18, 19, 20, 29/30, 33, 34, 37/38, 41/42, 43, 58, 59, 63, 64, 68/69, 72, 74, 81
	-	3, 6, 15, 22/24, 23, 28, 40, 47, 49, 50-52, 53, 57, 60, 67, 71, 75/76, 77/78, 79/80, 82	2, 4, 5, 10, 21, 39, 61, 62, 70

^a Numbers in cells identify households ($N = 67$).^b Chi-square = 6.7 ($df = 1$, $p \leq .01$).

of rugs; and 62, whose orphaned members have moved to Kangavar, is no longer a viable household.

In sum, of Aliabad's 67 households, more than half ($N = 39$) send one or more males to Tehran to work on a seasonal basis; almost two-thirds ($N = 25$) of these households are landless. These migrant laborers not only dislike Tehran, and are biding their time until they can return to live full time in Aliabad, but they hope to be able to purchase land when national legislation permits them to do so. It was not feasible to obtain detailed data on the cash incomes of these individuals. Much if not all of what they bring in is said to be converted into food, fodder, and brideprice payments. The following discussion is admittedly limited somewhat by its lack of data on the incomes and expenditures of seasonally out-migrating villagers. However, it seems reasonable to assume that cash earned by such men is used to purchase the products of local land and livestock and that any "excess" income is not sufficiently great to change the relative economic rank of their households. Finally, it is noteworthy that when Aliabadis discuss wealth, they do so in terms of land and animals.⁷

⁷"Wealth" and "income" are not synonymous; wealth is not something one "uses up." Although a unit of currency is used in the following analysis (see note 8), the reader should bear in mind that households' relative wealth is at issue. Some of the possible material correlates of out-migration, which produces income for both less wealthy and more wealthy households, are discussed below. Unskilled laborers in Tehran reportedly earned between 300 and 1000 *rials* per diem (in 1975). These figures might be used in conjunction with those for the number of migrant workers per household (Table 3.7) to develop very rough estimates of the amount of cash that the workers might bring into the village. Following several months' absence, one man returned with 10,000 *rials*;

PROPERTY HOLDINGS AND ECONOMIC RANK

It has been noted that only half of Aliabad's households own land. In gross terms, therefore, the landed and landless groups can be compared with one another, and within each group households can also be compared. However, a comparison of any two or more individual households, and a ranking of the entire village sample, require a variable common to all 67 households. The most parsimonious measure of wealth with which to compare all households is *rials*, the Iranian unit of currency.⁸

Using monetary values obtained from Aliabadis during 1975, holdings in land and livestock were computed for each household, such that these can be described in terms of wealth (in *rials*), and compared with others, using the same measure. The scale for conversion is shown in Table 3.3. The exclusion of some categories of wealth in land⁹ and animals should be noted. Poultry, for example, were omitted in computing household wealth. Chickens, turkeys, ducks, geese, and a few pigeons are found in many houses, but their numbers fluctuate even within the course of a single month, and it appears virtually impossible to make a meaningful census of fowl. During the summer months, poultry, eggs, and

his brother (after a comparably long absence) brought back 30,000 and a sewing machine. Much of the cash which they brought into Aliabad was used by their household to purchase fodder. It is worth recalling that participation in the national economy is, for migrant workers, "chancy" (Stirling 1965:266).

⁸Sixty-five Iranian *rials* = \$1 U.S. (1975); for comparison with Irons' (1975) figures, 1 *toman* = 10 *rials*. One difficulty in using this measure is presented by inflation, particularly recent sharp rate increases related to production, transport, and sale of oil. In Aliabad, annual installment payments for those who purchased land in 1962 apparently do not change although national rates of inflation increase, whereas the cost of land transferred now (e.g., house lots) as well as the price of fodder and therefore livestock, do. Thus land may be becoming increasingly expensive although installment-paying landholders are not paying more for it. In contrast, those who must purchase the products of this land pay increased prices. As the cost of fodder increases for those who must purchase it because they do not grow it, the maintenance of livestock, or the increase in livestock holdings, becomes an increasingly costly proposition. The rich may be getting richer, and the poor poorer. Because it is difficult to evaluate this proposition, all the data collected in Aliabad are treated as synchronous. These considerations might, however, interest archaeologists developing retrodictive propositions, and ethnographers making predictive statements about relative wealth during the coming years.

⁹Garden land was not included in the ranking of Aliabad's households because metric values of gardens were not systematically recorded, although households' ownership or nonownership of gardens was. Aliabad's gardens are unlike orchards in parts of southern Iraq and lowland western Iran; for the most part, they are small plots on which fodders and vegetables, and a few fruit trees and in some cases grapes and melons, are grown. The extensive date orchard and the often diminutive mixed-crop gardens of Aliabad and other small Kangavar area settlements could hardly be more dissimilar. On the other hand, ownership of gardens does indicate that capital did or can change hands, so that those owning gardens may be considered comparatively wealthier than those who do not own any land whatsoever. Garden land in Aliabad is not subject to the same governmentally regulated freeze as fields; ownership of such lots continues to be transferred, with some buyers (e.g., 30) using such purchased land to construct new houses. Lacking metric data for gardens, it is not possible to rank those families owning them vis à vis one another. However, a chi-square test of the association between ownership of gardens and field land produces a value of 27.72 (df = 1; $p \leq .01$), suggesting an association between ownership of the two categories of land. Thus, although one is currently transferable and the other is not, ownership of either type of land might be used as a crude measure of comparative wealth, with owners of either apparently generally being in a higher economic bracket than those owning neither.

TABLE 3.3
Value of Aliabad Animals and Landholdings, 1975

Item	Market value (<i>rials</i>)	Comment
Chicken	100/kg live weight (5 <i>rials</i> /egg)	Not used to rank households
Beehive	2,500–3,000	2,750 used in ranking
Goat	2,500–3,000	2,700 used in ranking ^a
Sheep	4,000–5,000	4,500 used in ranking
Sheep/goat ^b	n.a.	3,600 used in ranking
Donkey	1,000–1,500	1,250 used in ranking
Cow	13,000–20,000	15,000 used in ranking ^c
Horse	10,000–20,000	15,000 used in ranking
Land ^d	—	60,000/ <i>juft</i> used in ranking

^a The figure of 2,700 rather than 2,750 *rials* is used because of a slight discrepancy in informants' accounts of the price of goats.

^b Where it was unclear (n.a.) what proportion of a household's flock comprises sheep as opposed to goats, the midpoint between the mean values for sheep and goats was used.

^c It is said that if cattle are small or scrawny, one can sometimes purchase two for 17,000 *rials*. A calf sells for 2000 *rials* but is not considered economically productive until its third year. A "good" ox can sell for as much as 25,000 *rials*. The figure 15,000 *rials* is an arbitrary way of handling incomplete data on whether cattle owned are cows or oxen (which are slightly more costly).

^d Informants said that the price of field land is the same as garden land and house lots. On the basis of information about recent purchases of such (measured) lands, and other data on landholdings, it was possible to compute the cost of fields even though owners do not always know the metric value of their holdings (speaking instead in terms of *juft* or *pa*). The mean metric value of an Aliabad *juft* is taken to be 7 ha; a *juft* sells for 60,000 *rials*. In the absence of metric data for *juft* sizes of most neighboring villages' lands, it is assumed for operational purposes that landholdings by Aliabadis in other villages are the same both in cost and metric value.

small quantities of mutton, lamb, or goat are generally purchased from butcher shops in Kangavar or in the nearest village. Dogs and cats are not purchased, and are (reportedly) rarely fed by humans; they too are excluded from the present analysis.

Aliabadis describe their landholdings in terms of the *juft* (Lambton 1953:4f., 244). This is not a metric unit, but rather a term that, translated literally, means "pair": it is the amount of land which a team of oxen can plow. Comparable terms exist elsewhere in Iran (e.g., the *khish* in Khuzistan and the *zouj* in central Iran) and elsewhere in Southwest Asia (Bowen-Jones 1968:587; Sweet 1960:58f.). In all of these cases, *juft* (or the parallel term) may refer either to the amount of land plowed in a given year, or to land plowed in the course of 2 years in places where alternate-year fallowing is practiced.¹⁰ Since soils and topography vary,

¹⁰My computations for the metric value of the *juft* in Khuzistan (ranging from 4 to 14 ha) are based on Goodell (1975), Rouholamini (1973), and unpublished data made available through the Development and Resources

the metric value of a *juft* varies as well. Not only are there differences between metric values of the Zagros and Khuzistan *juft*, for example, but even within the central Iranian Zagros the value of the *juft* varies somewhat.¹¹ The *jarib*, a metric unit that has been used in Iran for several centuries (Lambton 1953:277, 407) and which is also used in Afghanistan (Gentelle 1972), is recognized but rarely used in discussions among Aliabadis. In this village, informants may not know how many *jarib* they have or, as in the case of one household head, may provide inconsistent information about holdings in *jarib*, reflecting unfamiliarity with the term.¹² Informants differ in their estimates of the metric value of the Aliabad *juft*, and of neighboring villages' *jufts*, and they seem generally more inclined to think of landholdings in terms of labor and time rather than metric area. Between them, Aliabad's landowning households control a total of 43 *juft*. Of these, 32 are in the immediate vicinity (or *mulk*) of Aliabad, and are said to "belong" to it. An additional 11 *juft* are in the *mulk* of nearby villages, and most Aliabad owners travel to these fields rather than hire laborers to work them.

Because analysis of the available data strongly suggests that the metric value of the Aliabad *juft* is approximately 7 ha, this value is used in the present study.¹³ Mean size of landholdings for the 33 landowning households is 9.1 ha; median holding size is 5.8 ha. These figures are comparable with those reported by Bowen-Jones (1968:576) for Kurdistan province in 1960. There, 45% of all holdings were under 5 ha, and 23% of holdings were between 5 and 10 ha. The "typical worked plot, whatever the holding size, averaged 1.4 hectares." In most cases, holdings were divided into several noncontiguous plots, as is the case in Aliabad and surrounding villages (Young, personal communication; see Ajami 1969:65). Dividing its hectareage by Aliabad's total population (418), and assuming alternate-year fallow, one arrives at the mean figure of either .54 or .72 ha per person per year, depending on whether 32 or 43 *juft* are used. Because the village uses a total of 43 *juft* (301 ha), even though they are not limited to the

Corporation, New York. I am much indebted to Robin Dennell (University of Sheffield) for discussing with me during 1975 some of the difficulties surrounding the concept. Watson (1979) also treats this problematical term, used with comparable ambiguity in Hasanabad, roughly 100 km from Aliabad.

¹¹T. Cuyler Young, Jr. (personal communication) reports that the value of a *juft* in Godin (near Kangavar) is 8 ha; farther east, in Hosseinabad, the *juft* is reportedly about 6 ha (Miller 1964:489).

¹²Even the value of a *jarib* varies regionally. Aliabadis use what Lambton (1953:407) terms the "Tehran *jarib*," with a value of 1000 m². The villagers describe the *jarib* in metric terms. One villager, to be sure I understood his meaning, said that 10 *jarib* equal 1 ha. However, he and many other Aliabadis are unsure of their own holdings in hectares or *jarib*, although they show a willingness to venture what are sometimes imaginative estimates. Portions of a *juft* are often referred to as "feet" (of oxen), *pa*. Since 1 *juft* (theoretically) requires a pair of oxen to work it, it may be referred to as 8 *pa*; if a man owns three-quarters of a *juft*, he will describe it as 6 *pa*. Lambton has discussed the relationship between draft animals, area sown, and holding size (1953:367ff.).

¹³The two sources used in computing the metric value of Aliabad's *juft* (which were not all visited or measured during 1975) are (a) aerial photographs interpreted in accordance with informants' statements about boundaries of the village's lands (i.e., its 32 *juft*), and (b) the published gazetteer listing for Aliabad's holdings. As was previously noted, villagers provided inconsistent and sometimes blatantly contradictory information; I am convinced that this was not out of a desire to be deceptive, but reflects the fact that metric attributes of landholdings are essentially irrelevant to them.

TABLE 3.4
Distribution of Aliabad Landholdings by *juft* and Family Name^a

Number of households	Juft per household	Hectares per household	Total jufts	Total holdings (juft) by family name ^b					Number of households with migrant laborers
				M	D	S	o		
34	0	0	0	[14]	[11]	[2]	[7]	25	
1	.25	1.75	.25		.25			1	
10	.50	3.50	5.00	3.0 (1.5)	1.00	1.00		5	
3	.75	5.25	2.25		.75	1.50		2	
3	.83	5.81	2.50			2.50 (.5)		1	
9	1.00	7.00	9.00	2.0 (1.0)	6.0 (.5)	1.00		5	
2	1.50	10.50	3.00		1.50		1.50	0	
1	2.50	17.50	2.50	2.5 (2.0)				0	
2	3.00	21.00	6.00	3.00	3.00			0	
1	3.50	24.50	3.50		3.5 (1.5)			0	
1	9.00	63.00	9.00	9.0 (4.0)				0	
67			43.00 (11.00)	19.50 (8.50)	16.00 (2.00)	6.00 (.50)	1.50	39	

^a Numbers in parentheses indicate landholdings in the *mulk* of other villages. Of the 43.00 *juft* total, 11.00 are not in Aliabad proper.

^b Many household heads with family name "D" are descendants of a former headman. The category "o" comprises seven family names; most households in this group are relatively recent immigrants (see Figure 4.20). Numbers in brackets indicate distribution of landless households by family name.

area immediately surrounding the settlement, the figure of .72 ha is used here. (Dividing the mean holding [9.1 ha] of the 33 landholding households by mean household size [6.2] would yield an average individual holding of 1.5 ha. If this figure were halved, allowing for fallowing, each of Aliabad's people would be supported—on average and regardless of status—by .73 ha per year.) Table 3.4 summarizes data on the size of Aliabadis' landholdings. It should be reiterated that these holdings do not now support a landlord, nor do they produce a substantial surplus for a commercial market.

As in other societies in which land and livestock are closely interrelated (Barth 1969:372; Bates 1973:213; Miller 1964), there are in Aliabad strong positive correlations between holdings in these productive resources.¹⁴ People owning livestock must feed them; landowners are better able to raise fodder than those who do not own land and who must accordingly make critical decisions about the expenditure of cash for fodder and for products meant for human consump-

TABLE 3.5
Ownership of Caprovids in Aliabad, 1975^a

Category	Ownership (by family name)				Number of households
	S	D	M	o	
No livestock	1 (1)	3	2 (1)	2	8 (2)
Goats but no sheep	1 (1)	1	5 (1)	2	9 (2)
Caprovids (breakdown unclear)		1 (1)	2		3 (1)
Sheep (with or without goats and other livestock)	8 (6)	16 (11)	15 (7)	4 (1)	43 (25)
No sheep or goats but other livestock			4 (3)		4 (3)
Totals	10	21	28	8	67
Number landless	2	9	16	7	34
Percentage landed	80	57	43	12.5	

^a Numbers in parentheses refer to landowners; all others are landless.

¹⁴A chi-square test of the association between ownership of land and ownership of cattle yields a value of 22.7 (df = 1; $p \leq .01$). Similarly, the chi-square measure of association between ownership of donkeys and land is 21.5 (df = 1), significant at the same level. There is a high positive Pearson product-moment coefficient correlation (r) between size of landholding and number of caprovids owned ($N = 33$, $r = .92$; significant (p) at the .01 level). This correlation is skewed by the extremely large holdings of a single household (79/80); when this household is removed from the sample, the correlation between landholdings and caprovids is lower but still strong ($r = .75$, $p \leq .01$).

tion, or about the allocation of rented land to the cultivation of various crops. Draft animals, in particular, are unlikely to be owned by a household unless it owns and works land. Few of Aliabad's households own either kind of draft animal if they do not also own land. In contrast, several of its landless households own sheep and/or goats (Table 3.5). Households owning livestock but no land are, to judge from informants' accounts, most vulnerable to fluctuations in annual precipitation and hence the market price of fodder (which they must purchase); it is these households that tend to sell and repurchase livestock as environmental and market conditions fluctuate from one year to the next, for they feel it necessary to rid themselves of livestock that they cannot afford to feed.

Horses are particularly expensive to maintain, although not necessarily to purchase. As in Tell Toqaan, where horses and mules are owned only by the village's main landowners (Sweet 1960:91ff.), the two horses in Aliabad belong to the two wealthiest households (79/80, 47). Both animals are occasionally ridden, but since neither is used in long-distance travel, and neither has any other apparent economic value, such as in transport or traction, they are assumed to function primarily as status markers. At the other end of the spectrum, the poorest landless households ($N = 7$) which do own animals possess only a few goats; an association between ownership of goats and comparative poverty has



Figure 3.2. Young shepherd and mixed flock in river bed at Aliabad's southeast (facing houses 3a and 17).

TABLE 3.6
Selected Household Characteristics by Wealth Quartile, Aliabad, 1975

Characteristic	Wealth quartile ^a			
	1	2	3	4
N	17	17	17	16
Number owning land	3	6	8	16
Percentage owning land	18	35	47	100
Number of migrant laborers	10	12	11	6
Percentage with migrant laborers	59	71	65	38
Household size, $\bar{X}^b$	4.6	5.8	5.9	8.6
Median household size ^b	4	6	5	8
Family name				
S	1	3	3	3
D	4	6	4	7
M	8	8	7	5
o	4	0	3	1

^a 1: 0–33,500 *rials*; $\bar{X}$ = 16,209, median = 16,250, S.D. = 13,480.

2: 33,501–100,250 *rials*; $\bar{X}$ = 73,926, median = 79,550, S.D. = 18,496.

3: 100,251–156,050 *rials*; $\bar{X}$ = 126,856, median = 126,750, S.D. = 17,644.

4: 156,051–5,243,750 *rials*; $\bar{X}$ = 645,875, median = 257,000; S.D. = 1,205,806.

^b Household size includes all members. See Table 4.3 for relationships between wealth (quartiles) and compound area (quartiles).

also been explicitly noted in a description of Asvan, in Turkey (Payne 1973:301). Six of Aliabad's 67 households own neither land nor livestock (4, 13, 20, 21, 58, 62). They satisfy their food and fuel requirements by purchase (with cash) and by occasional "borrowing." Only one of these households (21, a lone widow) occupies a compound possessing a stable; this house originally belonged to another household, however. Two households without livestock (57, 65/66) own land. Twelve of Aliabad's households own no sheep or goats, but of these, four (39, 40, 60, 71) have one donkey and/or a couple of cattle. Three of these households are landowners; the fourth (39) has access to land of near kin. With a total of approximately 2400 caprovids in the village (sheep outnumbering goats by about 8 to 1), the average household flock (in 55 households) is 44; the median is 20. (Spread over all 67 households, caprovids would average 36 per household, with a median of 17 and a standard deviation of 122). Flock size ranges from none to 67.3 sheep and/or goats per household, and the mean number per villager is 5.7. According to Lambton (1969:26), where conditions were "more favorable" before 1962, peasant households had 5–10 sheep and goats, and sometimes more.

For analytic purposes, Aliabad's households' holdings in land and livestock were converted to *rials*. The 67 individual households can be ranked in terms of this measure; to facilitate some comparisons, they were also arranged in quartiles. Table 3.6 summarizes some of the Aliabad data for economic quartiles and

selected related variables. As is the case in Irons' and Bates' studies, and in the Turkish village of Yassihoyuk (Table 3.1), there is a positive relationship between household size and wealth; families in the wealthiest quartile (Q4) live in larger households and in larger compounds (see Table 4.3). When wealth consists largely of land and livestock, it should be advantageous to have more people on hand to maintain and process subsistence products, and to supply labor for such simultaneous but spatially segregated tasks as herding flocks and tending fields. Further, since wealthy households control basic subsistence resources, many in the highest quartile need not send sons to Tehran on a seasonal basis (Table 3.6), and, like Yassihoyuk's wealthier households, are able to marry them off at a younger age. Reproduction may begin earlier and the birth interval in comparatively wealthy households may be somewhat shorter than it is in lower-ranking households, which are affected by husbands' repeated out-migration (Binford and Chasko 1976; Irons 1975). It is likely that in the past wealthier households were better able to bribe military officials and hence to limit or prevent their sons' conscription and enforced absence.

ECONOMIC VARIATION AND MATERIAL CULTURE

In Aliabad, a wide range of portable objects and immovable features reflects variation in economic status, and many of them may be preserved archaeologically. For example, certain architectural features require capital investment and in this respect differ from most structures, which are built with the most basic materials by residents and close kin, whose labor in the village context is not measured in monetary terms. Wells and latrines are installed by specialists paid for their services, and are not present in all compounds. Holdings in land and animals are reflected in such architectural features as pens, stables, storerooms, hives, coops, and troughs; facilities for the storage of food products (bins, gunnysacks, large jars, and pits) are similarly located within compound walls. It is probable that these would not be equally represented in the archaeological record, and for reasons discussed more fully below, some appear to be more useful indicators of variations in economic rank than others. Given the degree to which Aliabadis borrow, inherit, and in various other ways "curate" valued portable objects, it can be argued that architectural elements are at least equally reliable indicators of economic variation (see Chapter 4).¹⁵

¹⁵Neither architecture nor the elements of material culture discussed here were used to rank Aliabad's households. Had systematic inventories of portable objects been made for all households, they would have provided an interesting independent test of my economic ranking based on *rials* (see Gremliza 1966-1967:44; Watson 1978). At present, the proposition that portable objects (which circulate among households and are curated in varying degree) do not reflect household population or economic rank remains untested.

In any given house there are, in addition to its architectural features per se, portable items that might be incorporated in the archaeological record. These include utensils for food preparation, consumption, and storage; such personal belongings as clothing, jewelry, and watches; household decorations (in particular, rugs, pictures, and plaques); and items for entertainment (radios, record players, tape recorders, opium pipes). Sewing machines and bicycles are housed within the compound, as are portions of threshing sledges, sickles, scythes, grindstones, and other technological items related to subsistence. "Expensive" items include antique heirloom trays made of comparatively costly metals; however, households owning these heirlooms would not necessarily be in a position to purchase them today. The number and diversity of portable items vary among households. Some of them are "exotic" imports, like those purchased by pilgrims to Meshed. There are variations in the distribution, quality, and number of other household furnishings, including rugs. It appears that as in Tell Toqaan, a felt mat laid over one of reeds reflects "a small increment of affluence" (Sweet 1960:118), and some households (e.g., 22/24) have "curated" (heirloom) carpets, but like other portable floor coverings, they are of perishable materials. There are also variations in the spatial distribution of items usually purchased with cash; bicycles, radios, tape recorders, record players, clocks, and sickles, threshing blades, and scythes are not found in all houses. The distribution of portable items shown in Table 3.7 indicates that households in the wealthier quartiles do not necessarily possess more record players, tape recorders, and sewing machines than those in poorer quartiles. Some of these items (e.g., sewing machines) are (in theory) more likely to belong to households with migrant laborers, who are more likely to have both cash and greater access to the diverse goods available in Tehran. It seems that, as in the Fars villages studied by Ajami (1969:66), wealthier households are likely to own radios (the most popular type of imported technological item). The same is true for bicycles, which are comparatively expensive and therefore less frequently seen.¹⁶ However, although electronic equipment is often prominently displayed within houses, such items do not necessarily function. Some in Aliabad had been purchased secondhand, and many are typologically almost antiques. For these reasons, it is difficult to assign them a cost. Radios are owned by more than two-thirds of Aliabad's households; their abundance is partly a function of the village's proximity to the Iraqi border, since radios are a popular item for international smuggling in this area.

In contrast to electronic equipment, such items as metal threshing sledge blades, metal sickles, and scythes should suggest to the archaeologist (if such items were found) that he or she was excavating the paraphernalia of a landowning family and probably, therefore, dealing with a comparatively wealthy house-

¹⁶The chi-square association of bicycles and wealth quartiles is 8.28 ($df = 3$, $p \leq .05$).

TABLE 3.7
Distribution of Elements Used to Rank Allabad Households^a

Land and Livestock										Portable items ^c							Total score		
Household	Household size ^b	Migrant laborers	Land (juff)	Garden(s)	Number of caproids	Number of cattle	Number of donkeys	Horse	Wealth ^c (rials)	Pilgrimage ^d	Bicycle ^e	Motor vehicle ^e	Radio	Record player	Tape recorder	Sewing machine ^b		Scythe ^d	Metal sledge blades
1	15 (3)	4		+	20	4			123,150	+	+	+		+		+	+		7
2	7 (1)				30		2		110,500		+			+					4
3	8		1.5	+	32	1	1		253,000	+	+	½		+					8
3a	3	1			5				13,500	+	n.a.			n.a.	n.a.	n.a.			—
4	5			+					0			+		+	+				6
5	6 (1)				17		1		61,550		+			+					4
6	5		.5	+	22	1	1		134,450	+		+		+					4
7	5	2		+	7	1			33,500		(+)								0
8	5 (1)	1			9				40,500		+			+					4
9	2	1			14				59,400		+			+					4
10	4 (1)				30		1		136,250					+					1
11	7 (1)	1	1.0	+	50	3	1		322,250	+				+					1
12	5	1	.75		22	1	1		153,050		+			+					3
13	2	1							0		+			+					4
14	8 (2)			+	18		1		82,250					n.a.	n.a.	n.a.			—
15	2		.75		20		1		136,250					+					1
16	5 (1)	1		+	17				82,000					n.a.					3
17	6	2	.25	+	13	1			91,250	+	+			+					4
18	9 (1)	2			7				31,500		+			+					4
19	7	1			12	1			52,400					+					0
20	4 (1)	1							0					+	n.a.	n.a.			1
21	1								0										—
22/24	12 (1)		3.0	+	82	3			616,400	+	+			n.a.	n.a.	n.a.		+	5
23	5		1.0	+	40	3	1		261,000		(+)			+					1
25	7	1	1.0	+	19	2	1		164,250		+			+					4
26/27	8	1	1.0	+	31	1	1		232,450		+			+					4
28	5		1.0	+	8	4	1		147,000					+					0
29/30	6 (1)	2			28		1		105,650					+					1
31/32	8 (1)	2	.75	+	47	4	1		281,750	+				+	n.a.	n.a.			1
33	6	1			7		2		21,400					+					—
34	5 (1)	1			25				112,500					+					1
35/36	7 (1)	1	1.0	+	18	2	1		156,050	+	+			+		+			6
37/38	8	3			18	1	1		81,050	+	+			n.a.	n.a.				4
39	4			+		3			33,250		n.a.			n.d.	n.a.	n.a.			—
40	5 (1)		.5				2		32,500					+					0
41/42	8 (1)	2			7				18,900	+	+			+	+	+	+		7
43	6 (1)	1			30				135,000		n.a.		n.d.	n.a.	n.a.	n.a.			—

44/45	8 (1)	1	.5	10	2	1	75,250	+	n.a.	n.d.	n.a.	—
46	4	1	.5	12	1	1	100,250			+		1
47	9		3.5	160	2	3	974,500	+	+	+	+	7
48	7	1	.83	24	1	1	166,850		+	+		4
49	3		.83	9	2	1	99,550			+		1
50-52	12 (2)		1.5	28	2	1	227,550			+		5
53	5 (1)		1.0	72	1	1	396,650	+		+	+	2
54-56	11 (1)	3	1.0	33	1	2	231,600	+	+	+	+	8
57	4		.5				30,000			+		1
58	4	1					0			+		1
59	6 (1)	1		5		1	14,750	+		+		1
60	5 (1)		2.5		2		167,000		+	+	+	6
61	2			5			16,250	+		+		0
62	3						0		n.a.	n.a.	n.a.	—
63	6	2		30		1	82,250			+		1
64	5	3		34			149,400	+		+		1
65/66	8	2	.5				30,000		n.a.	n.a.	n.a.	—
67	4 (1)					1	109,750	+		+		1
68/69	11 (1)	2	.5	17			40,500			+		1
70	6 (1)			15		1	68,750			+		1
71	3 (1)		.5		2	1	61,250		n.a.	n.a.	n.a.	—
72	8 (1)	2		28	1		115,800	(+)	+	+		4
73	6	2	.5	16		1	103,250	+		+		4
74	6 (1)	1		22			101,750			+		1
75/76	14		3.0	80	4	2	598,250	+		+	n.a.	6 (+?)
77/78	6 (1)		1.0	23	3	1	196,750	+	+	+		4
79/80	15		9.0	1010	10	5	5,243,750	+	+	+	n.a.	9 (+?)
81	6	1		17	2		99,000	+		+		1
82	5 (1)		.83	5	1	1	79,550		+	+		3
83	5 (1)	1	.5	28		1	126,750		+	+		1

^a Plususes indicate presence; blanks, absence; n.a., data not available.

^b Numbers in parentheses refer to number of children less than about 2 years of age.

^c Figures refer to holdings in land and livestock (and functioning beehives) in summer 1975 (converted to *rials*), not to annual income; by quartile: Q1 = 0-33,500, Q2 = 33,501-10,250, Q3 = 100,251-156,050, Q4 = 156,051-5,243,750.

^d Most pilgrimages were to Meshed; those in parentheses refer to pilgrimages to Kerbela.

^e Assigned a value of 1 unless noted otherwise.

^f Bicycles are assigned a value of 3. Those sold during summer 1975 are shown in parentheses.

^g Vehicles (scooter, tractor, and truck ["bus"]) and shares in vehicles are assigned a value of 4.

^h Sewing machines are assigned a value of 2.

ⁱ The scythe is assigned a value of 2.

hold. The cost of a metal sledge blade, for example, is five times that of a wooden one; the price of a scythe (of which there is only one in the village) is three to four times that of a sickle. The scythe, preferred (by some Aliabadis) over the sickle for harvesting, is occasionally borrowed by friends of its owner, who also owns one of Aliabad's two horses. Like this scythe, rotary querns are circulated among households. These items cost the equivalent of a day's labor in the Kangavar area, and there are only three in the village. The widespread sharing of such items not only suggests that an archaeologist might wrongly attribute ownership to the houses in which they might be found, but reinforces the impression, based on many villagers' claims that they and their houses are "all alike," that differences among them are de-emphasized.

Two other entries in Table 3.7 require comment. There are three motor vehicles in Aliabad. These are the motorcycle owned by a nonlandowner (4, who contributes to its upkeep by selling occasional rides on the vehicle), a tractor owned jointly by three households (3, 75/76, and 79/80), and the village "bus" owned by the nonlandowning co-head of household 50-52. Each of these vehicles has become part of the village scene within the past 10 years; the "bus" and the motorcycle have been in Aliabad for 2 and 3 years, respectively, and the tractor is a replacement for one purchased by household 79/80 about 10 years ago. Like the motorcycle, the truck and the tractor require expenditures for maintenance and fuel, but they are also a source of income, since their use is sometimes rented to other villagers. When not in use, the tractor and the motorcycle are stored in their owners' compounds; the "bus" is generally kept out of doors, but is sometimes driven into an unused and partly disintegrated storeroom at the west end of compound 50-52. Whether any evidence of these vehicles would be retrieved from the archaeological remains of this village is a moot question. If they and the imported portable items listed in Table 3.7 are conservatively coded for relative purchase cost, there is a moderate positive correlation between ownership of such items and wealth quartile.¹⁷

In addition to the items described above, certain portable objects associated with religious pilgrimages are found in a number of houses and should eventually find their way into archaeological deposits, perhaps as heirlooms. As Muslims, the residents of Aliabad express (when asked) the desire to make the pilgrimage to Mecca; none, however, has ever done so. As a second choice, the Shi'ite center of Kerbela (in Iraq) is considered sufficiently prestigious so that

¹⁷N = 57; $r = .42$, $p \leq .01$. In contrast, there is an insignificant r value of .07 ($N = 57$) between ownership of such items and number of migrant workers in a household. Data on the *rial* value of the motor vehicles were not obtained. In the case of 4, at least, the possession of a vehicle probably marginally increases his "wealth" (in *rials*) above zero; his neighbors describe him as poor nonetheless. Data on vehicle-generated income and on expenditures for fuel and upkeep are not available.

pilgrims are both referred to and addressed by their given name preceded with the honorific “*Kerbela*” (as opposed to “*Hajji*,” an honorific title awarded pilgrims to Mecca). Two of Aliabad’s older men had been to Kerbela before the extended early 1970s border conflict between Iran and Iraq, but they have no tangible mementoes of their trips. A third important site for pilgrimage is Meshed, in Khorasan province (northeastern Iran); the inclusive cost of a trip was said to be less than half that of the *hajj*.¹⁸

Table 3.7 indicates that many more households in the wealthiest quartile (Q4) have been to Meshed than those in poorer quartiles.¹⁹ Whether a family or couple opts to make the pilgrimage depends not only on whether they can raise the necessary capital, of course, but also on whether they are sufficiently devout to decide to allocate cash resources to such a trip. Aliabad does not have a mosque; its inhabitants do not normally pray the five times daily required by Quranic law, and many of them do not visit the mosques or shrines available to them in neighboring villages. Nonetheless, having made the pilgrimage to Meshed confers an honorific title, and Aliabadis who have made this trip display, in their living rooms, mementoes in the form of carved stone ashtrays, sugar bowls, and plaques (Wulff 1966:130ff.), and formal (framed and often glazed) photographs. Other exotic imports are occasionally associated with such a trip (such as gold earrings and embroidered sheepskin vests made in Afghanistan but purchased in Iran’s northeast), but some of these are of perishable materials. It would appear that making this pilgrimage reflects both a particular ideological orientation and an ability to spend capital on an activity which confers prestige and may be reflected in a small number of diagnostic but not always strictly practical portable objects. Miller notes that in Hosseinabad, which is somewhat closer than Aliabad to Tehran and therefore to Meshed, it is the wealthier residents who make the pilgrimage (1964:493). The Aliabad data suggest that given the cost of the trip, pilgrimage is probably not within the realm of economic possibility for all villagers. However, some of those financially able to exercise the option do not make the pilgrimage because they are not particularly devout. On the other hand, relatively poor but very devout villagers may put off other expenditures in order to visit a holy city. Even an archaeologist assuming that no artifacts deriving from Meshed had been obtained from relatives as gifts would not necessarily be correct in assuming that a house containing such mementoes had been comparatively affluent.

¹⁸It was said that the cost of making the *hajj* (to Mecca) is between 15,000 and 20,000 *rials* for one person. In contrast, 10,000 *rials* would, reportedly, cover the cost of a 12-day trip for two, all expenses included, to Meshed, with a brief stopover in Tehran (where one would, presumably, stay with a relative or neighbor).

¹⁹However, a chi-square test of the association between pilgrimage and wealth in *rials* (the sample being dichotomized as below or above median village wealth) yields the value of 3.4 (df = 1; $p \leq .1$).

VARIATION IN MORTUARY TREATMENT

In contrast to the pilgrimage, the gravestone is an important cultural item about which economic decisions must be made by all villagers, since all are responsible for the burial of kin. The nearest graves in Aliabad's cemetery are about 80 m from the village and the cemetery, on fairly flat ground, might well not be found in the course of an archaeological surface survey several centuries from now. Indeed, some informants casually mentioned that they thought that the site of the village's cemetery had shifted, but there are comparatively few surface indications of the earlier graveyard (see Figure 3.3). An undisturbed Late Bronze Age tomb found at Godin Tepe, nearer Kangavar, suggests that alluviation may bury low-lying cemeteries with relative rapidity. At Godin, a tomb marked by a massive stone superstructure was not detected on the modern ground surface, although it may date to a period as recent (in terms of geological time) as about 3000 years ago (Young 1969).

Its cemetery lies to Aliabad's north, and is bounded by the river to its east and a track and fields to its west. In expanding, therefore, it moves in a generally northerly direction. The cemetery is roughly divided into three sections: that currently used for prepubescent children in the south, that currently used for adults to its north, and an older section in the southeast, in which many low grave mounds are eroded and stones displaced. Throughout the cemetery, many children's graves are completely unmarked; if the graves are old, they are not even visible as low mounds. At Godin, and at Hasanabad (near Kermanshah), the modern cemetery is about 1 km from the village proper; at Hasanabad there is a separate babies' cemetery (Watson 1979). Because such detail is not provided in most ethnographic accounts, it is not clear how widespread this pattern of spatial differentiation is.

In the Aliabad cemetery, in addition to 63 unmarked graves (some those of juveniles), there are three types of grave markers. First, there are those made with rough river cobbles; most of the 77 graves in this group consist of low mounds with a cobble at the head and one at the foot (for men) and (often but not invariably) a third in the center of the mound (for women).²⁰ Nikitine (1922:342) describes Kurdish graves as typically possessing two stones, one each at the head and foot. In Aliabad, a few graves have a sparse ring of stones marking the perimeter of the grave mound. The second type of grave marker consists of an unmarked horizontal cement slab; such a grave marker reflects a financial investment, since the cement must be purchased. Cement slabs can be construed as marking interments of individuals (or kin of individuals) with slightly higher economic rank than those with cobbles. There are eight cement slabs without inscriptions, and seven are inscribed. Finally, there are small but rather elabo-

²⁰Aliabad women born elsewhere are buried here.

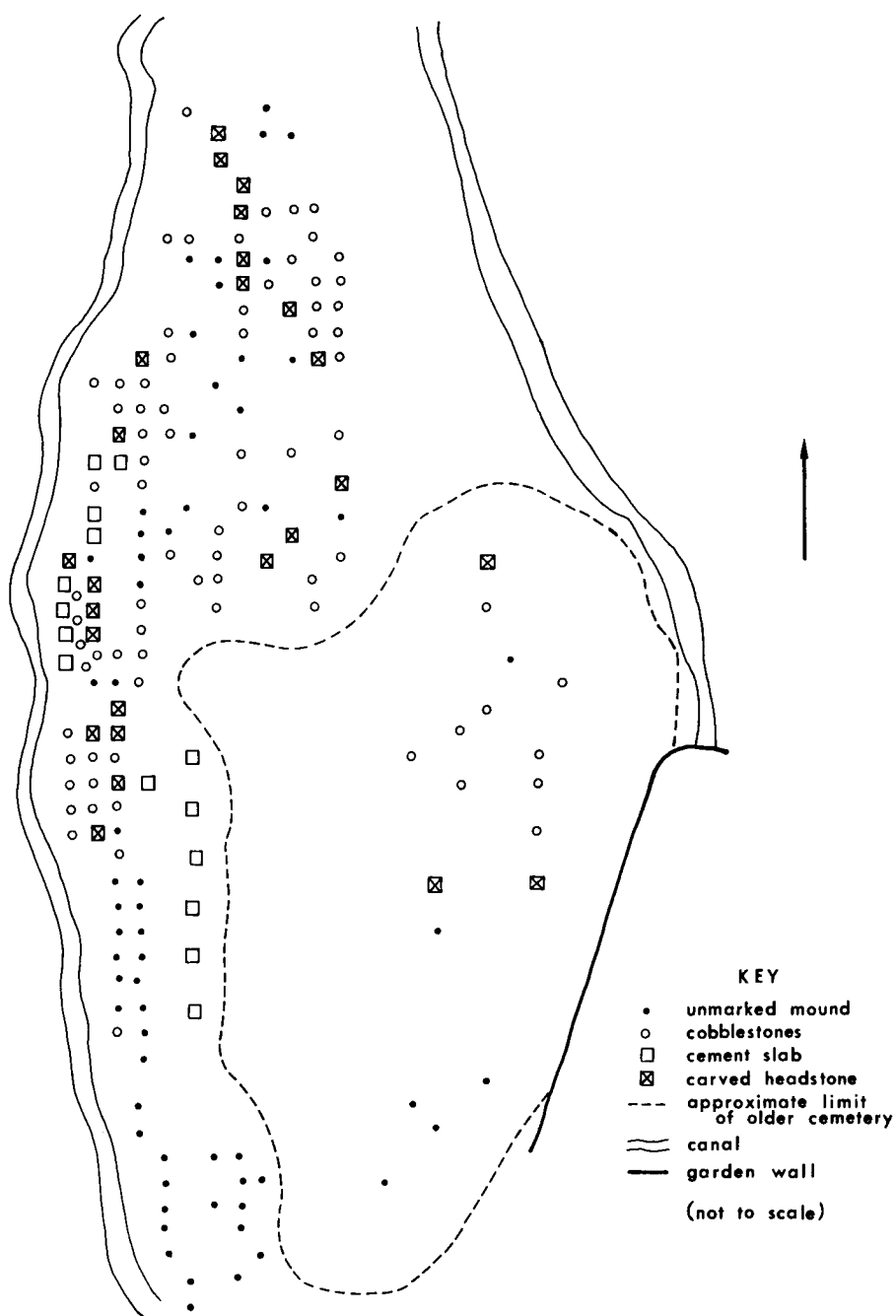


Figure 3.3. Aliabad cemetery (schematic plan).

rately handcarved stone grave markers purchased from craftsmen in Hamadan and Tuyserkan. The price of such a stone, generally inscribed with the deceased's name, date of death, and the name of either a parent or child, is two to three times that of a cement slab, excluding transport costs.²¹ As of August 1975, the cemetery had approximately 25 such carved headstones; an additional seven were set into the cement slabs just referred to. Because of villagers' reactions to an unusual set of deaths in 1975, it was impossible to map the cemetery in a systematic fashion. Thus, although it is reliable in terms of number and location of graves of differing types, Figure 3.3 is schematic.

Mortuary practices in Aliabad appear to conform in broad outline with those reported elsewhere in the Muslim world.²² Informants describe mortuary treatment as devoid of status markers. Each cadaver is washed and wrapped in a plain shroud, then interred in a simple unlined pit 2–3 m long, 75 cm wide, and about 1 m deep. The body is reportedly first covered with large stones, and these in turn are covered with earth; the grave marker is then placed on the surface. It is important to villagers that burials be sufficiently deep and protected (by stones) that dogs cannot disturb them. Some villagers said that, ideally, the dead should be buried near close kin, and that there should be about 1 m separating graves. A similar pattern is implied in an account of burial practices in Tell Toqaan (Sweet 1960:215), and Etherton (1971:186) refers to towns in Algeria whose cemeteries have separate burial grounds for members of different clans.

Graves of deceased kin are not visited frequently, but this may in part reflect the fact that intervillage mobility precludes many Aliabadis from having many close relatives buried in its cemetery. Although most or all adolescent and adult men participate in interment procedures, and although under normal circumstances flocks, shepherds, and other villagers frequently and casually traverse the cemetery, even fairly recent interments cannot always be accurately identified by Aliabadis unless they have inscribed headstones.

As Figure 3.3 indicates, the different types of grave markers are, with one exception, fairly evenly distributed throughout Aliabad's cemetery. Despite a stated preference for "family plots," individuals in different economic brackets are not differentially distributed in space, presumably because people who die are set into plots perceived as "available" at any particular time. However, six sudden and simultaneous deaths are represented by a row of six cement slabs, each with inset carved stone. The grave of a seventh individual, who died of different causes but very shortly thereafter, is set off slightly to their side but otherwise

²¹Fifty kilograms of cement costs 220 *rials*; an inscribed headstone costs 600 to 700 *rials*. Energy expenditures are difficult to standardize: cobbles are carried to the cemetery from the nearby river, cement is mixed locally, and headstones are carved by urban specialists.

²²Sweet (1960:213ff.) describes two deaths in Tell Toqaan; Hansen (1961) discusses aspects of mortuary behavior in Iraqi Kurdistan. Presumably one reason for the relative paucity of ethnographic detail about mortuary practices is that during the average brief period of ethnographic fieldwork in small communities, comparatively few adult deaths occur.

received the same treatment, even though she was a member of a relatively poor household. Four of the six individuals just referred to were members of two of the village's wealthiest households; a fifth was also from a household in the top quartile, and the sixth (like the seventh person) ranked in the lowest wealth quartile, but was a member of a widely respected family, an unmarried man "cut off in his prime," and his death was considered to some extent the fault of the two wealthiest households, which also lost members on the same occasion. It is likely that if these individuals had died of more ordinary causes and at differing times there would have been somewhat more variability in their graves.²³ It is also probable that they would have had a different spatial distribution.

In general, unless the deceased were close kin, the death was very recent, or the grave has an inscription, villagers cannot identify graves. I was not able to collect information on the familial affiliations of those interred under uninscribed cement slabs. Data on 16 of the 25 graves with inscribed stone markers (excluding the most recent seven) were collected. Three of them belong to individuals who cannot be related with certainty to contemporary village households. Five of the remaining 13 are immediate kin of the previous headman, who is also buried beneath such a stone. Today the majority of agnatic and affinal kin of this man rank in the top two quartiles. Of the remaining seven carved headstones for which data are available, three represent immediate kin (brother, father, and mother) of household heads now in the highest wealth quartile; three are immediate kin (son, father, wife) of individuals now in the third quartile. Only one of the 16 carved stones represents an individual whose household is currently in the poorest (first) quartile. One of those representing the fourth quartile is the brother of the wealthiest household head in Aliabad (residing in 79/80). Because this wealthy family (75/76, 79/80) is not otherwise represented in this sample, and because it has a long history in the village, it seems reasonable to assume that at least some of the nine carved gravestones which could not be transcribed in 1975 belong to deceased members of that family.

The purchase of carved headstones appears to be a luxury indulged in primarily by the wealthy. Since the Aliabad sample is so small, and since it is not clear who is buried beneath the uninscribed grave markers, it is impossible to demonstrate direct associations between variation in wealth within the village and variation in headstones of individual households' deceased relatives. The data nonetheless clearly indicate that just as there are variations in wealth among the living, so too are there differences in at least some aspects of mortuary treatment

²³The seventh grave mentioned is that of a pregnant tubercular woman whose early death, in contrast to the previous six, was anticipated. Given villagers' low morale, it seems plausible that contributions to her mortuary rites were made by the suddenly ill-favored wealthy households; however, I have no data on the source of cash invested in her grave. The mortuary "feast" marking her burial (as in the other deaths) entailed contributions from all village households, in the form of flour, baked bread, and (women's) labor in food preparation. I do not know whether her feast involved the consumption of beef, as the others did, but the number of visitors and the relative absence of fanfare and bustle on that day suggest that it probably did not.

(see also Sweet 1960:56). From the most inexpensive to the most costly (in terms of both capital and energy expenditure), the four categories of grave are (a) unmarked, (b) those marked with plain river cobbles, (c) those marked with plain cement slabs, and (d) those marked with carved stones. A fifth group combining the two most expensive forms of grave marker commemorates a unique tragedy. However, since there are reportedly no variations in treatment of the body and no grave furnishings other than a shroud, a sample of excavated interments would not necessarily reflect the variability evident in the markers above them.

There is a growing literature on the use of mortuary data to distinguish between ranked and egalitarian social systems (e.g., Binford 1971; Tainter 1978). Among other things, this literature suggests that in egalitarian societies, graves will be quite variable, that the major axes of variability will be age and sex (since statuses are ascribed along such lines, as well as achieved with age), and that children will not be accorded the same treatment as adults. In nonegalitarian societies some children's burials are similar to those of some adults, and members of different social groups may be spatially segregated, as in modern Spain (Gilmore 1977). In ideologically egalitarian Aliabad, differential mortuary treatment is accorded individuals along lines of age and sex (children's graves are often not marked at all; women and men have a different number and arrangement of cobbles). At the same time, cadavers are apparently treated the same way regardless of age, sex, or group affiliation (the similarity being attributable to universal adherence to Islam). Finally, some juveniles and adult women are accorded the burial marker that is both most costly and numerically least common. The two "cheapest" grave types, unmarked mounds and those marked only with river cobbles, comprise the vast majority (numbering 140, or 78% of the total). This imbalance in proportion of grave types is one that Tainter (1978:133) and Peebles and Kus (1977:438) would expect to see in a nonegalitarian society. Villagers' awareness of status differences may be reinforced by the morphological variations among grave markers; the wealthier villagers are remembered (thanks to their inscribed headstones), whereas the poorer become increasingly undifferentiated with the passing of time.

SUMMARY AND ARCHAEOLOGICAL COMMENT

From the perspective of the larger system, the rural community of Aliabad is not characterized by marked socioeconomic complexity or great inequality. However, economic variation does exist even within this small, comparatively "traditional" village. Such variation appears to reflect a "reality of inequality" that coexists with an egalitarian ideology (Black 1972; Lewis 1970:179), and to be based on differences in ownership of land and livestock, still the basic means of production and the measures by which villagers evaluate their own relative

wealth. This is so despite the fact that some members of this community migrate as laborers to Tehran, and as participants in a cash economy organized on a national scale can purchase food and materiel necessary for survival. One might expect such economic variations to be paralleled by variability in material items that might eventually be transformed into archaeological residues.

Some of the variables examined in the foregoing admittedly inconclusive but perhaps suggestive attempt to evaluate this proposition include grave markers in the village cemetery, participation of households in pilgrimage to Meshed (which usually brings with it the importation of material items prominently displayed in the home), ownership of a range of portable items reflecting recent technological advances and obtained with cash (radios, bicycles, etc.), and residential architecture (discussed in Chapter 4). The presence of some costly portable items in several of the village's poorer houses may be attributable to the relatively greater participation of such households in the migrating work force; members of these households have greater access to these items while in urban centers, and purchase them with cash earned there. Other items, such as carved stone plaques and sugar bowls, and carefully framed photographs, are acquired during pilgrimage to Meshed, which is made by comparatively wealthier members of the community. Yet other portable items, such as threshing sledge components, are stored in houses belonging to landed members of the community, and thus indirectly reflect the comparatively high economic status of such households; in some cases, the materials of which such items are made (e.g., metal, rather than wooden, sledge blades) are further indications of economic differentiation.

It was noted that although ownership of livestock may fluctuate from one year to the next, such ownership is often reflected in various structural features in a given compound and these, being built of packed mud or mud brick, would probably be preserved archaeologically. Of the six Aliabad households which have neither land nor livestock, only one resides in a house (which had not belonged to her family) with a stable. However, an additional eight households without stables do possess livestock. Such cases underscore the need both to look for such additional functionally related features as pens and troughs, and to examine soils, which should confirm the presence of livestock in areas interpreted on structural grounds as stables or pens and which might also suggest the ownership of livestock where such architectural evidence is absent.

Such structures and soils may not necessarily permit archaeologists to identify the mammalian species kept in house compounds, and it is probably imprudent to rely exclusively on retrieved animal bones for identification of households' livestock. When fodder proves expensive, the donkey is the first species to be "eliminated." During a particularly trying winter following a very dry year, some of Aliabad's donkeys were released to wander freely in the area surrounding the village. Although five donkeys died, only the remains of one were (serendipitously) found because, at some distance from the village, the animal had fallen

into an archaeological trench in which excavations were subsequently resumed. This incident affected the distribution of faunal remains and, like patterns of trash disposal, it suggests that some archaeological samples within settlements may be both quantitatively underrepresentative and skewed. It also suggests that archaeologists might profitably study paleontologists' work in taphonomy (Behrensmeyer and Hill 1980) and, perhaps, that despite their limitations architectural remains can be used in coarse-grained reconstructions of households' livestock holdings. Although it might not be feasible to make precise reconstructions of individual households' holdings in species and numbers, a sample of several houses would facilitate comparisons on the community level.

The village cemetery reflects economic variation in the form of differentiated grave markers, but an egalitarian Muslim ideology is reflected in the (reportedly) standardized treatment of cadavers. For an archaeologist, the first difficulty presented by a cemetery like Aliabad's would be in locating it, and the second would be the identification of variation among graves. It is questionable whether grave markers could be retrieved, being susceptible both to burial and to quarrying by subsequent inhabitants; it is also debatable whether variations observed among graves could be conclusively attributed either to chronological or to economic variation.

There is considerable archaeological evidence for variability in mortuary treatment in the pre-Islamic Middle East. Viewed from this long-term perspective, Islamic burial practices might be described as "anomalous" in their relative lack of evidence of socioeconomic variation such as might be manifested in grave goods and variations in orientation of the body (and mortuary practices in the Islamic world might also be used to support the argument that past behavior does not always have parallels in the present). It would be incorrect to ignore the ethnographic evidence or to trivialize differences between ancient and modern practices. Islamic and earlier burial practices are not comparable in form, but both are characterized by variability among contemporaneous graves. Today, this diversity appears to be related to differences in age, sex, and economic rank. Despite an egalitarian ideology, material evidence of economic variation can be seen in modern burials, and it can, at least potentially, be incorporated in the archaeological record. Because of the impact and precepts of Islam, such material correlates of variation in rank are perhaps fewer and less diverse than they were in earlier periods in this and other Islamic areas. For example, although excavated pre-Islamic burials from the Kangavar area do not constitute a large sample, an apparently unique and very elaborate tomb at Godin Tepe was associated with a horse burial (Young 1969). Such "grave goods" would be inconceivable in this region today; on the other hand, because it is unique and its construction reflects the investment of considerable energy, this tomb may suggest that several millennia ago the horse was a marker of wealth, as it appears to be in the area today. There is some ethnographic evidence suggesting that in larger and sociologically

more heterogeneous communities (such as Tripoli, in Lebanon; Gulick 1967), spatial segregation of the dead of different social groups may also play an important role in reinforcing status differences (Etherton 1971). In any case, regardless of precise formal attributes, the existence in both the past and the present of contemporaneous graves differentiated along some of the lines described here may be used to infer the existence of organizational principles involving, in part, the ranking of community members.

However, the foregoing review suggests that no single feature of material culture is a definitive or invariably useful measure of variations in households' rank. Rather, the ethnographic data discussed here suggest that a number of classes of evidence might be used in combination to establish the existence, if not the precise scale, of economic variation in small rural settlements. One source of information about differences among a community's households is its residential architecture, discussed in the following chapter.

4

Spatial Organization and Residential Architecture



Much archaeological work treating architecture in more than descriptive terms attempts to explain observed variation. A good deal of the literature reflects a concern with identifying functionally specific (“activity”) areas and social groupings (e.g., Chang 1968; Clarke 1977; Hill 1968, 1970; Longacre 1970a, 1970b). Several cross-cultural studies have focused on variation in house form (e.g., Hunter-Anderson 1977; Whiting and Ayres 1968) or size (Divale 1977; Ember 1973), in part to specify relationships between residential architecture and household size and residence patterns. Data on habitation areas have also been used in efforts to reconstruct some of the demographic parameters of prehistoric populations (Cook and Heizer 1968; LeBlanc 1971; Naroll 1962; Redman and Anzalone 1980; Wiessner 1974). Rather fewer attempts have been made to specify relationships between architectural and economic variation (Ayres 1978; Watson 1978), although several ethnographic studies claim that such relationships exist (e.g., Etherton 1971; Fraser 1968; Lewis 1970; Rapoport 1969; Schwerdtfeger 1971).

It seems that only rarely are any two or more houses in a settlement identical in form or size. Residential structures are settings for a variety of activities; they shelter residents in varying numbers and groupings; and their locations, sizes, materials, and internal organization vary within and among communities. This

chapter describes the residential architecture of Aliabad, specifies the diagnostic attributes of functional areas, and considers some of the relationships between architectural variation and economic and demographic characteristics of the resident population. A concluding section examines spatial distributions of kin and the village's architectural growth pattern.

Aliabad comprises 67 houses arranged in blocks of contiguous compounds separated from one another by winding alleys (Figure 2.1). The composition of compounds' households varies, but the residential pattern in the village as a whole reflects a preference for extended virilocal family households (Figure 2.2). Shops and storerooms, entered from an alley, are attached to some houses, and several compounds have contiguous garden plots, but most gardens are located at the village's periphery. A communal bathhouse is slightly to Aliabad's north; another architecturally unique structure, a government school attended only by young boys, is at the village's northwest corner. Scattered in open spaces within the village and at its edges are a number of heavily pitted areas where garbage may be dumped and where dung and other fuels are processed. Its fields surround the village on three sides, and those of a neighboring village are on the fourth.

Houses and gardens are surrounded by walls of varying height but, unlike some other villages in central and western Iran, Aliabad is not enclosed by a wall. Since most Southwest Asian mounds are formed by decomposed structures, it is possible to predict which portions of the village would be transformed into visible (archaeological) mounds. The surrounding fields will probably contain no visible mounding, since even the few and rarely erected temporary structures, the flimsiest of huts, are only built for the harvest season. The village cemetery and threshing floor would probably not be visible to an archaeologist several centuries hence. Excluding these areas, as well as the surrounding fields and gardens, the village of Aliabad will probably be transformed into a mound of some 3 ha in extent. Unmounded areas might be tested in a systematic program designed to locate chemical alterations resulting from human activity.

The following pages treat selected aspects of Aliabad's architecture in detail. Before turning to a description of construction technology and spatial organization of the village's residential structures, I outline the salient features of its nonarchitectural areas. These areas, in which a variety of important social and economic activities are carried out, comprise a substantial proportion of the village's total area. At least some of these are likely to be encountered in sampling the archaeological residues of such a settlement, and a provisional reconstruction of their chief functions might be possible. Like its structural features, the attributes, locations, and areal extent of nonarchitectural activity areas within contemporary Aliabad should have heuristic value not only for archaeological reconstructions but for the formulation of archaeological sampling design in Southwest Asia and elsewhere.

NONARCHITECTURAL AREAS IN ALIABAD

The village cemetery covers an area of approximately 1 ha (Figure 3.3). It is bounded on the east by the river and on the west by the main path leading in to the settlement. Grazing animals wander over the cemetery, which is covered by sparse low-growing shrubs and grasses, and villagers casually traverse it on their way to fields and neighboring communities. Except for the few days before and during a funeral and the ritually important fortieth day following a burial, the village cemetery is not the scene of any social activity. (In nearby towns, in contrast, cemeteries are often visited on Fridays by kin of those interred in them.) It has been suggested that the cemetery itself will probably never be discernible in the form of significant mounding, and that it will fall beyond the spatial limits of any substantial remains of the village, since it lacks aboveground structures and its southern limit is almost 100 m to the north of the northernmost house walls. The topographic inconspicuousness of cemeteries and their distance from villages seem to be characteristic of this part of the Zagros and suggest that archaeologists seeking mortuary data should systematically sample areas adjacent to as well as within mounded sites.

In Iran, threshing floors are the scene of crucial but highly seasonal economic activities. They also sometimes reflect energy investments; for example, they are sometimes plastered and/or terraced. However, throughout much of western Iran, at least, there is a tendency to locate threshing floors away from villages (see Figure 4.1). Aliabad's threshing floor is situated at some distance from the village proper; like the cemetery, it is unlikely to be easily detectable several centuries from now. The threshing floor was previously located at what was then the village's western edge. It is said to have been shifted across the river in about 1960, both because several villagers wished to build houses on its traditional site and because some feared that a fire on the threshing floor could endanger village houses. When asked, however, villagers could not recall any fires, and the general impression formed from talking with Aliabadis is that fire is not a significant cause of house abandonment or destruction in the area today.

As in other Kangavar area villages, there would probably be little archaeological evidence indicating the function of the threshing floor, since the area stands bare and essentially unused for most of the year. During late summer and early fall, each farmer brings his produce to his customary spot on the threshing floor, and works independently for about a month following the harvest. Among villages in this area, Aliabad is apparently somewhat unusual in having a substantial architectural feature on its threshing floor; this so-called "wrecked building" was reportedly built by the former headman to house his herds when the river was too high to bring them back from pasture in the evening. In cold weather today, this decaying structure is used for the same purpose; in the warmer months, harvested fodder is piled within its walls prior to threshing. There are no other features in



Figure 4.1. Threshing floor and brick-making area at periphery of a village near Aliabad.

the vicinity of the threshing floor, which is approximately 2 ha in extent. If the cemetery and threshing floor areas are added to that of the village proper, the effective size of the “site” is almost doubled.

The cemetery and threshing floor are large and functionally important areas situated beyond the limits of the settlement’s architecture. Within the village there are also areas devoid of architectural features in which important activities are carried out. Among these is a group of open areas, between blocks of structures, which may be referred to as “village commons”; some of them are functionally but not formally similar to town squares, which often have fountains or monuments. A group of villagers once facetiously referred to one such area (east of 33 and 34) as “ash square.” Yet this village “square,” marked by old wall stubs and ash middens, is not often used for public gatherings, possibly because its surface is very irregular and it offers little shade during much of the day. Aside from this jesting reference, Aliabadis do not use any particular term to refer to the few larger open areas that do function as village commons. During a crisis that affected the entire village, people gathered to exchange information and provide mutual succor in the ample shade of a long wall (an area along the west wall of 34, which faces the one government building and constitutes the village’s only potential “parking lot,” and where a track leading to a distant paved road begins). Smaller informal gatherings for a range of economic activities (e.g., cleaning

wheat) were also observed in the area to the southwest of a garden belonging to 1 and in the areas to the east of the houses of 25, 74, and 77/78. The most important public gathering place is the village spring, at which adults and children washing and collecting household water supplies are constantly seen, and where gossip and other information are frequently exchanged. Women also occasionally gather along the river's west bank, to sort and wash harvested grain and to clean household utensils.

Although villagers frequently traverse rooftops to visit other households, they more often use arteries at ground level. Except for one wide north-south road referred to by some as an avenue rather than as a street or alley, these thoroughfares are irregularly shaped, winding through the settlement between house blocks and sometimes ending in cul-de-sacs at compound entrances (e.g., 47, 50). Alleys are generally 2–3 m wide, and their surfaces are irregular, marked with a shallow central depression and/or ditches along their outer edges (Figure 4.2). The ditches channel surface runoff but also tend to accumulate small quantities of domestic refuse. Alley surfaces are embedded with animal bone, ceramic and glass sherds, shoe and textile fragments, and fragments of broken ovens, beehives, and bins. When not on roofs, dogs are often encountered in the alleys just outside their houses, as is their excrement.

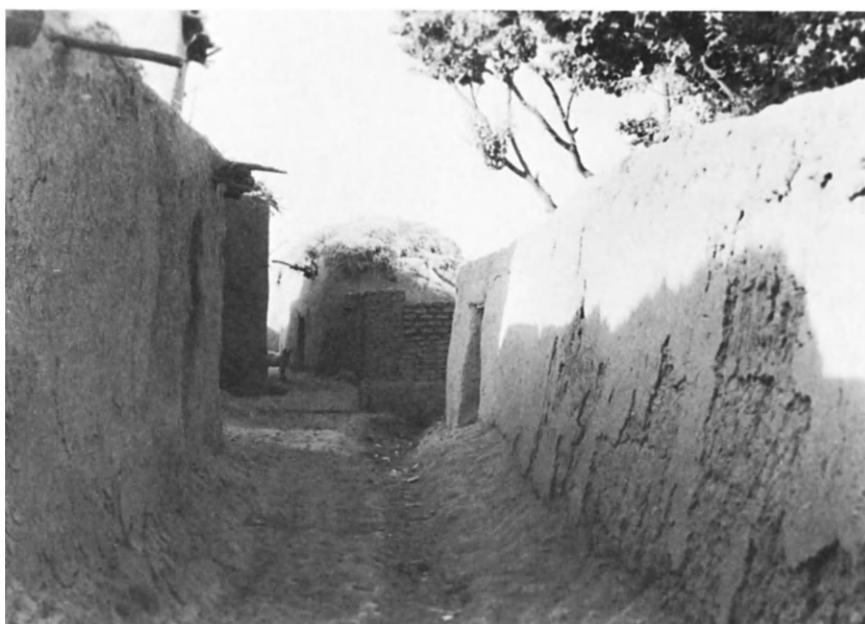


Figure 4.2. Aliabad alley (note blocked storeroom door to left, garden wall to right, roof storage in distance).

Aside from the debris scattered thinly over alleys and village commons, there are no extensive communal deposits of garbage within or at the edges of the village. The only clear type of midden in Aliabad is the ash pile, of which there are only a few. These piles are located outside compounds, either abutting their enclosure walls or farther away in a village commons. They are individually owned, and after a large quantity of ash has accumulated, the piles are shifted and the ash spread over fields as fertilizer. In one instance, during the course of such a shift, a pile of ash about 1 m high and 2 m in diameter sat in the middle of a major track between the village and its fields for several days before it was used.

Another kind of deposit whose distribution is areally limited is dung. For the most part (31/32 is an exception) fuel-processing areas are located at the village's edge, and would not necessarily be readily detected in the archaeological remains of this settlement. Women and girls work singly or in pairs in these areas, which are irregularly pitted and contain piles of moldering dung (including that of cattle, shoveled out of stables each morning and added to these piles) as well as dung cakes (laid flat and then stacked on end to dry thoroughly. After they are completely dried out, dung cakes are carried to individual houses and stored in piles that may reach almost to the ceiling of the storeroom in which they are kept. The year's supply of dung cakes is manufactured during rainless summer months. A household typically uses five or six dung cakes each day, or about 2000 per year.¹ The presence of dung on stable floors, and in storerooms, might be detected archaeologically and used to identify room functions.

Like fuel-processing areas, most gardens and orchards are in the immediate vicinity of the village; the few defined by villagers as being within the village are shown in Figure 2.1. In a few cases (e.g., 14, 16, 17), a wall extending behind the house encloses a "garden" in which the house well may be located. A few vegetables, clover or alfalfa, and some fruit trees are grown in such house gardens. More extensive cultivation is carried out in the gardens and small orchards not adjacent to houses: vegetables, grapes, melons, and fruit trees, as well as trees grown for use in construction, are found in these. With some difficulty and considerable skill, villagers capture bees from fruit trees in such gardens and install them in hives, which they take home and eventually set into house walls (Figure 4.3). During the hottest months, families occasionally picnic in their gardens, some of which double as communal latrines (e.g., 54–56). All gardens within or adjacent to the village are surrounded by walls up to 1.5 m high. Since neighbors occasionally "raid" one another's gardens for snacks, the walls are clearly not designed to limit human access; rather, they are said to be erected against the predations of grazing animals on their way to and from pasture. In at least one case (31/32), glass and metal fragments are set into the top of a garden

¹The price of a dung cake is 2 to 3 *rials*. Households without sufficient animal dung may obtain this fuel by exchange or with cash.



Figure 4.3. Beehives in an Aliabad kitchen wall (note whitewash, unused beehives on courtyard floor).

wall that reaches a maximum height of 1.6 m; however, there is no door in this wall, but rather a wide gap through which anyone might wander freely. This instance, with its seeming double message, suggests that walling serves primarily to define territory rather than to hide or protect the areas enclosed.

Finally, Aliabad's nonarchitectural areas include canals. The gravity-flow irrigation water used in Aliabad's gardens and fields originates at the nearest upstream village (approximately 3 km to the north). Narrow, shallow, unlined irrigation channels (up to 1 m in depth and 1 m in width) are, in some cases, crossed by bridges of any combination of packed mud, stones, and stout branches. They are cleaned once annually by all able-bodied male members of landholding households.

The surfaces of the outdoor areas and features described in the preceding pages are sufficiently distinctive, and sufficiently unlike those of the roofed areas discussed below, that plausible if provisional identifications of their archaeological counterparts might be made. It is also likely that the functions of particular architectural areas in Aliabad could be fairly readily established. Because different kinds of architectural areas are distinctive in certain respects, the archaeologist might be able to use these differences to identify functions of rooms. The following

section describes the kinds of architectural areas within Aliabad and discusses some of the attributes by which their archaeological residues might be identified.

ARCHITECTURE IN ALIABAD

Aliabad's architecture shares some of the general features seen in the vernacular architecture of other warm, arid habitats characterized by wide diurnal temperature variations. Mud, the basic building material, absorbs daytime heat slowly and radiates it during cooler nights; thick walls delay heat penetration into rooms, as do small windows. Internal courtyards remain cool for much of the day, partly because they are shadowed by walls except at high noon. Each courtyard provides both a sleeping area and a summer cooking area that minimizes the concentration of indoor heat. The clustering of houses in blocks serves to minimize the surface area exposed to solar radiation, and to shadow the alleys separating blocks. White- or buff-colored walls and roofs reflect heat, and small windows, usually opening onto the courtyard rather than the alley, minimize the amount of direct sunlight entering rooms (al-Azzawi 1969; Cockburn 1969; Rapoport 1969). The layering of mud in flat roofs insulates buildings against summer heat and, when covered with snow, against winter cold (Wagstaff 1973:203).

Aside from a few small freestanding latrines, the government school, and a village bathhouse, all of the structures in Aliabad serve the primary functions of housing people and livestock and of storing food, fuel, and household possessions (see Table 4.1). In its layout and building materials (baked brick), the school is unlike the other structures in the village. The same is true of the village bath, a semisubterranean structure at the northeast edge of the village which has not functioned for several years and is in a state of disrepair. Unlike the bath, which would have no resident caretaker were it functioning, the school includes one room that serves as the domicile for a succession of village teachers, employees of the government's Literacy Corps, the most recent of whom have been single men originally from a series of distant urban centers. In many respects the furnishings of the current teacher's residence compare with those found in other village living rooms, but there are also several items reflecting his somewhat higher economic status and his urban orientation, although these are few in number and perishable in nature (e.g., large quantities of candy, expensive leather shoes, certain garments, and books). The following discussion focuses on village houses, the most numerous and "representative" structures in the settlement.

The basic building materials are earth and wood (additional details regarding Iranian vernacular architecture are provided by Christensen [1967], Watson [1979], and Wulff [1966]). Earth is built up either as packed mud (*chineh*) or is



Figure 4.4. Wall construction (packed mud and mud plaster), Aliabad.

formed with a wooden mold into bricks, which are sun-dried. The few kiln-baked bricks in the village were made elsewhere; these are quite expensive and must be trucked in. The earth for bricks and *chineh* is usually excavated from the construction site itself; building proceeds around this excavation area. The first structure to be erected is the compound's enclosure wall; this is of *chineh* rather than brick.² Enclosing walls and those of the house itself are usually sunk into shallow foundation trenches, and built up as a series of courses, each of which is allowed to dry for a day or more, settling before the course above it is added (Figure 4.4). Variations in wall height and thickness are said to be paralleled by differences in depth and width of foundation trenches, and the few exposed foundation trenches for walls slated for construction suggest that this is indeed so.

Stone is very rarely used, and then almost exclusively in wall foundations, although in a few cases it was also observed as packing in partially collapsed

²Upton (1968:109) refers to "an Iranian law or custom which permits a squatter to claim ownership of land after a certain period of residence. He need only lay the bottom course of an enclosure wall and may live in the roughest type of shelter." (See also Lambton 1953:204f., 296; Petherbridge 1978:198.) Fathy (1969/1973) and McIntosh (1974, 1976) provide useful discussions of the qualities of mud as a building material. Fathy also discusses techniques of brick manufacture, as do Hall *et al.* (1973). In Aliabad, entrances to compounds are sometimes decorated with niches or shallow recesses next to the gate, and a few have small benchlike features facing the "avenue" (11, 12; see Figure 4.16).



Figure 4.5. Detail of roof construction in an Aliabad storeroom.

walling. Roofs consist either of unbaked brick vaults (beneath a second-story room, and in stables and many storerooms) or of flat packed mud and twigs over beams of trees grown specifically for roofing (Figure 4.5). In addition to wood, mud, and bricks, building materials include occasional bits of glass, tile, metal, plaster, and two varieties of whitewash. Though a few houses in neighboring villages are decorated with a plaster of red ocher (obtained on the nearby mountain), none in Aliabad are painted. Most houses possess some area with white surfacing; if in no other place, it is most likely to be found in the foyer, where guests enter and where all leave their shoes. When whitewash is used in kitchens, it is often casually applied as a thin, watery slip, and generally becomes grayed by smoke. Since whitewashing or plastering involve an expenditure of time (for quarrying) and/or money (purchasing it already processed), houses are not whitewashed annually.³ The frequency of plastering in Aliabad contrasts with a pattern reported elsewhere; for example, in Asvan (central Turkey), outer walls are plastered annually, and interior surfaces may be whitewashed several

³Some houses have more and/or thicker, cleaner whitewash than others. Data on this attribute and on secondary architectural elements such as windows and tiles were not systematically collected in 1975; they should be added to a list of building materials that might be used to rank houses along economic lines in any future investigation in this area (see Watson 1978 for such an attempt).

times each year (Hall *et al.*, 1973:259; Weinstein 1973:274). It would seem unwise to assume that the ages of Middle Eastern houses can be determined by counting the number of plaster layers on their surfaces, as some archaeologists have done.

In general, each man builds his own house, with intermittent assistance from kin or neighbors who may be more skilled but are usually available only seasonally. House construction is an activity of the rainless summer and early fall; if a building is to be finished during 1 year, it can (theoretically) be done within a few months, but sometimes the construction of a building, or even a single room, lags over a period of more than a year. For example, during 1975 there were several rooms which had been under construction for over 2 years (57, 34), and a second-story room (60) slated for construction that summer was never begun. On the other hand, substantial progress was made on another building begun then (30), although it was nowhere near completion when the fall rains began. When sun-dried bricks are made in large quantities for future use (e.g., 34) they are stored under a protective layer of mud in a courtyard corner and excavated as required.

In general, the first room to be built after the construction of the compound's enclosure wall is the kitchen which, if it is not quickly followed by other rooms, also doubles as a living room. A latrine is also sometimes erected in the earliest stages of compound construction. All compounds consist of enclosing walls surrounding a series of rooms and an unroofed courtyard; no compound in Aliabad has fewer than two rooms. Minimal requirements seem to be one room for human use, the other for storage (see Figure 4.6, which shows one of the smallest houses in the village). As a household grows, and as the builder has time to work on the house, rooms are added. The building sequence in the case of 1, for example, was: (a) courtyard wall and toilet, (b) kitchen, (c) subterranean stable, (d) stables and storerooms, (e) upstairs living room, (f) larger upstairs living room and (g) adjoining storeroom, and (h) shower (Figures 4.7 and 4.8). Residence in a two-story house appears to be an ideal throughout Aliabad, where second-story rooms are cooler during the summer months. Informants initially claimed that all houses in the village had two stories, yet in fact only half of them do. Houses are never constructed as two-story buildings; second-story rooms are only added several years into a compound's history. A 4-year-old house (34) was described as unusual because it already possessed a second story. Two-story dwellings may have implications both for estimating archaeological population size and for establishing differences in economic rank, and are discussed further below.

Because of the fortunate combination of building materials and climatic regime, architecture in the Zagros area is quite durable. When a house is abandoned, its beams are often removed. This appears to hasten the process of disintegration of at least the upper portions of walls. As mud or mud-brick walls

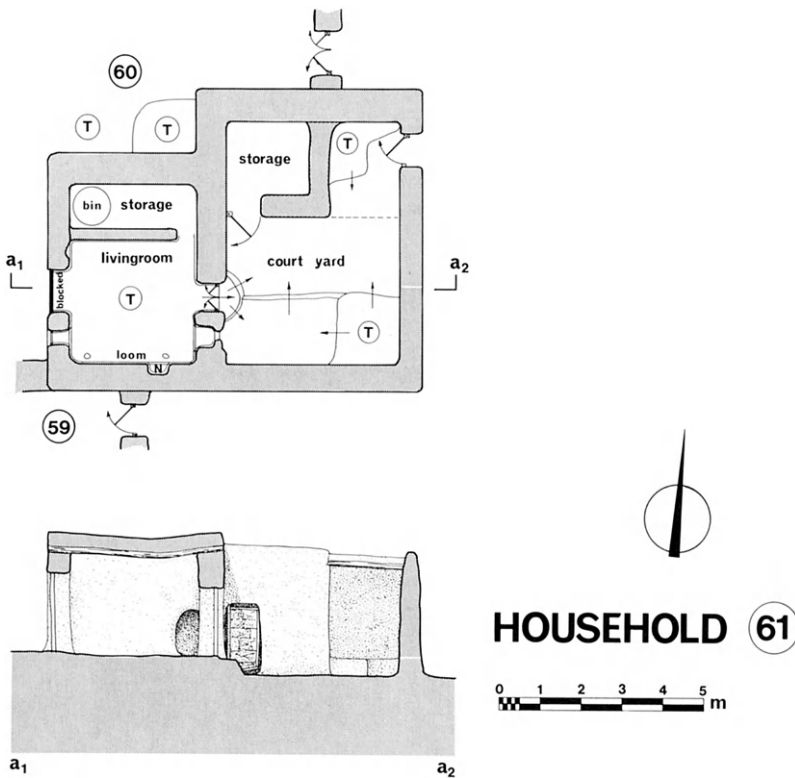


Figure 4.6. House 61, Aliabad (plan and section). T: *tanur* (oven), N: niche.

decay, they are partially sealed in by mud falling from above, which by surrounding and covering their bases tends to preserve walls as stubs (Figure 4.9). This pattern of decay may be seen in contemporary villages throughout the Middle East, and at numerous archaeological sites. It is thus reasonable to assume that much of Aliabad's architecture would be retrievable were the settlement to be abandoned and natural processes of disintegration left unchecked.

In discussing contemporary architecture in rural west Africa, Goody argues (1971:80) that "buildings reflect the composition of the dwelling group," and that mud structures have a "closer" fit than do those of stone or other more durable materials. An archaeologist finding well-preserved mud architecture might make a similar operational assumption. Mud is a malleable building material, and it is frequently used to make minor as well as major alterations (for example, resurfacing of floors and walls, and addition of new walls and features such as troughs). Some aspects of village architecture in an archaeological context might be misinterpreted. For example, in a village like Aliabad an archaeologist might wrongly

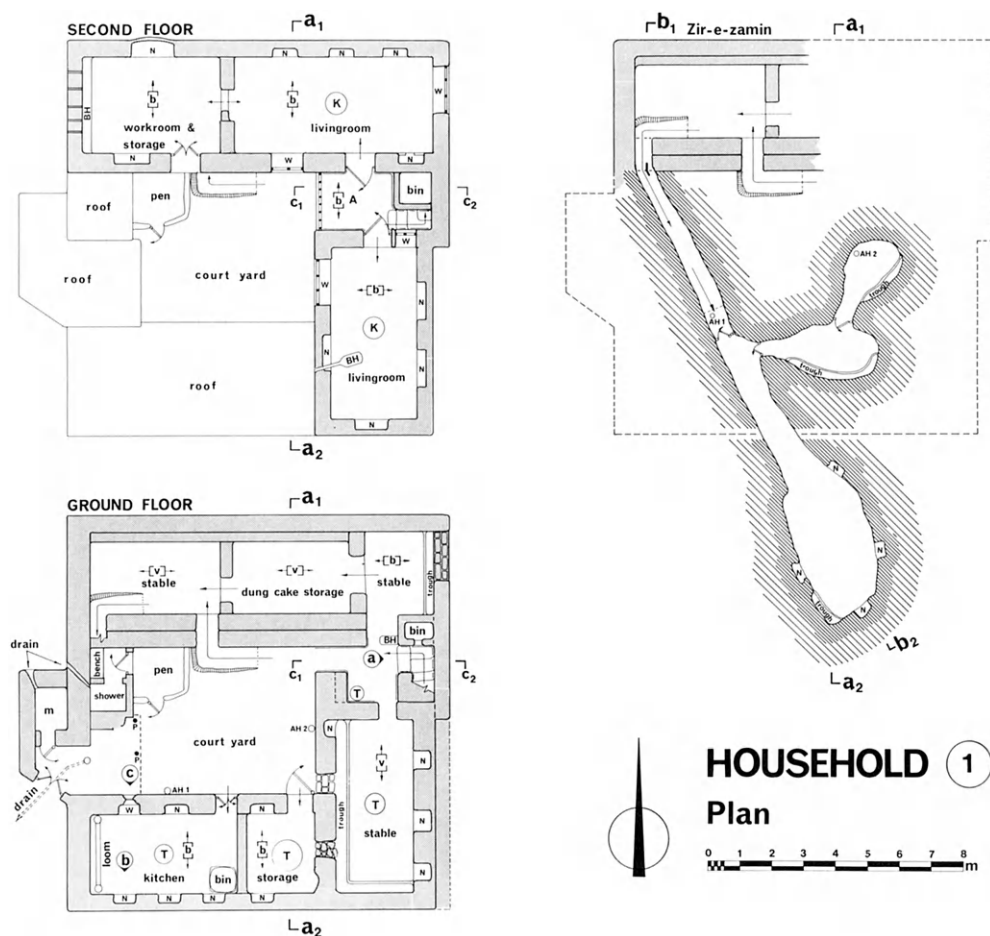


Figure 4.7. House 1, Aliabad (plans). T: *tanur* (oven), N: niche, K: *kursi* (hearth), AH: air hole (for oven), BH: beehive, m: *mustera* (toilet), W: window, b: horizontal (beam) ceiling, v: vaulted (brick) ceiling, P: wooden post (supporting light-weight roof). Details (circled a, b, and c) and sections (a, b, and c) are shown in Figure 4.8.

attribute a longer time span to what might be perceived as “building phases,” and real building phases might not be discerned because evidence of their existence had been obliterated during remodeling and renovation.

It is possible to determine the function of a particular contemporary room at any given point in time by the nature of its built-in features (and, to a somewhat lesser extent, its floor and wall surfacings and by such movable furnishings as rugs, chests, and pillows). However, during a house’s occupation, as family size and composition change, and as the household’s economic status changes, so too

may the nature of a compound's rooms. As the amount of land held or livestock owned vary over time, so too might storage and stabling facilities. Any given room can go through several major phases, as from a kitchen to a storeroom to a stable. Earlier functions may be detected easily during ethnographic research (as from a filled-in oven or hearth in what has more recently become a stable), but in an archaeological context such clues of recycling might be revealed only by the most meticulous excavation (Horne n.d.). In some circumstances, it would be quite difficult to detect earlier phases through which a given room had gone, and hence to reconstruct fully the series of activities carried out within the house throughout its occupational history. Furthermore, it appears unlikely that one could detect the sequential occupation of a given house by two or more unrelated households.

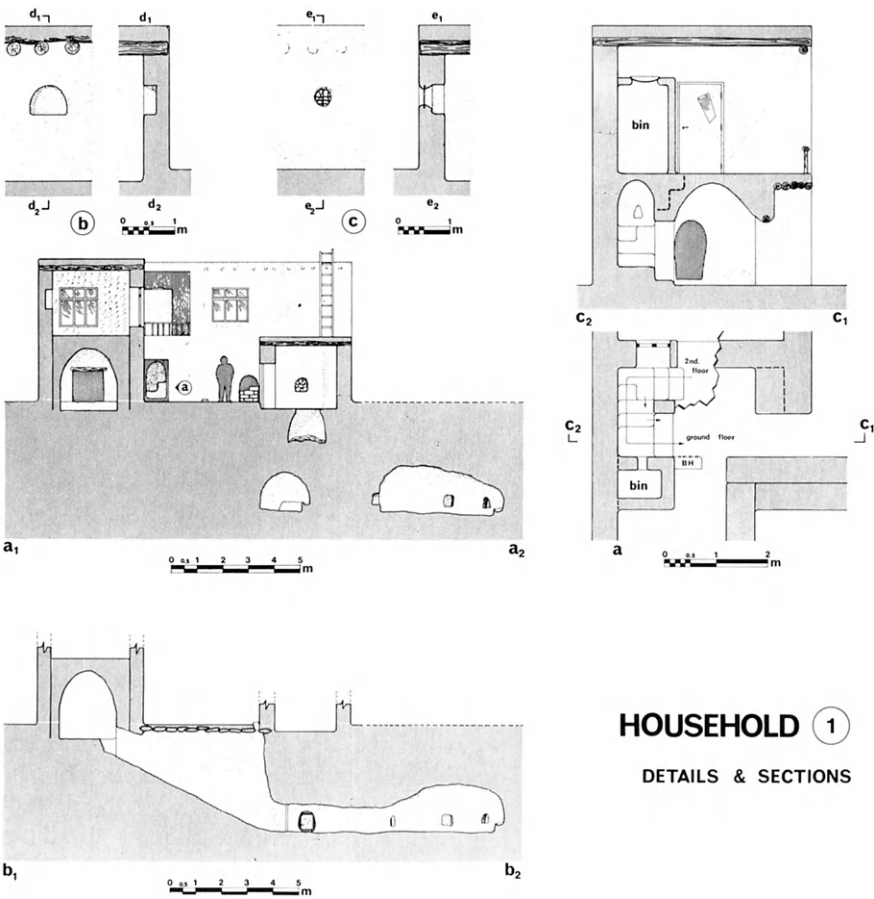


Figure 4.8. House 1, Aliabad (details and sections; see Figure 4.7).



Figure 4.9. Building decay, mounding, and “ramp” at north end of Aliabad (note blocked doorway to left).

But the picture is not entirely bleak. Although not all of Aliabad’s walls were measured, observations there suggest that much of the architectural history of a given house could be reconstructed by examining walls’ layout, thicknesses, and bondings—except, theoretically, in cases where abutting but nonbonded walls had been removed and the joint areas connecting walls carefully scraped down, a practice that does not appear to be part of the repertoire of construction strategies in this village; rather, joints and corners seem to be routinely covered over with chaff-tempered mud plaster. This suggests that archaeologists should not only expose architectural features, but should also dissect them carefully (see Figure 4.7). In Middle Eastern archaeology today, this is more frequently done in the case of brick structures than with those built of packed mud or combinations of mud and brick. The case of Aliabad also suggests that wall surfacings should be carefully sectioned, and the number and nature of wall surfacings and variations in associated floors recorded more carefully than is commonly done. The number of surfaces need not have chronological significance, except in the most general way, but variations in the number of surfaces in contemporaneous houses might imply economic differences among their residents. The depth and width of foundation trenches would provide some indication of the height of the structure anticipated by its builder, and the thickness of walls would be a useful indicator of

the presence or absence of a second story, for in general it appears that two-story structures are supported by walls about 1 m thick at ground level. Walls in one-story buildings tend to be substantially narrower.

ROOM ATTRIBUTES AND FUNCTIONS

In Aliabad, as has been mentioned, the first room to be constructed in a new house is its kitchen, where food is prepared and stored (Figure 4.10). When a compound also has a living room, this rather than the kitchen is the setting for food consumption. Aliabadi kitchens have a number of features that would probably be incorporated into its archaeological remains; these features have formally similar counterparts in some prehistoric sites in the Zagros.

All kitchens possess at least one oven, a large unbaked clay feature sunk into the floor in the center of the room and fueled by dung cakes whose fire is fed by air coming through a tunnel-like airshaft terminating in a hole situated in the courtyard (Figures 4.7 and 4.8). Ovens are made of clay sometimes mixed with salt and/or goat hair (reputed to minimize cracking). They are sunk into floors to a depth of about 1.5 m, their flat wide rims (sometimes burnished) flush with the



Figure 4.10. Aliabad kitchen, with storage bins, imported ceramic jars, beehive (in window to right), and plugged niche (behind bins).

floor. In two-story houses, kitchens are invariably located on the ground-floor level because the depth of the oven exceeds the thickness of a ceiling. No house is without an oven. Some compounds have more than one for, as in parts of Africa characterized by alternating wet and dry seasons (Denyer 1978; Oliver 1971; Prussin 1969), Aliabad householders' ideal is to have a warm weather outdoor oven in the courtyard. For a variety of reasons, not all households can achieve this objective. One limiting factor is the pattern of air circulation within the courtyard; smoke dispersal may be virtually nil and restrict cooking within the compound, and an outdoor oven may therefore be unused even if it is already installed.

In almost all compounds, the kitchen also houses one or more bins. These are set above the floor on four short feet made either of packed mud or sun-dried brick. They may also be propped up on a cluster of small stones. Occasional small bins are propped up with one or two sturdy twigs, as well as one or two *chineh* feet. Some are cylindrical, but most bins are cubical, their corners often gently rounded; some stand as high as 2 m. The top of the bin is either open, covered with a tray or a board, or has a clay "board" or plug inserted and plastered into place after the bin is filled. The contents of the bin (flour, unground wheat, or legumes) are generally retrieved from a small hole near its base; this hole is plugged when not in use. In Aliabad, bins vary in size and surface treatment. Almost all are coated on the inside with a thin wash; their exteriors are often carefully smoothed and frequently whitewashed. Some are decorated with appliqué ridges in either a geometric or a stylized representational motif (Figure 4.11), such as the "tree of life," also found on rugs. Village women, responsible for the manufacture of bins and ovens, report that both have a life expectancy of 5–20 years. In at least one case, a household's bins as well as its ovens are more than 20 years old and still in use. In all but two cases (an abandoned second-story room in 22/24, and a stairwell in 15), bins are located in ground-floor areas; this is said to be due to their great weight. Large rounded silos with holes near their bases have been excavated in Godin III (second millennium B.C.) context; they were not preserved to their full height and may not have been decorated.

The third major feature often housed in the kitchen is the loom. Upright looms, used exclusively to weave pile carpets, are built on two sturdy vertical poles sunk into shallow round holes excavated into the floor (see Hansen 1961:59). If a household's loom is dismantled seasonally, the poles are stored vertically in a corner but the holes are not covered or filled in. Not all Aliabad houses have looms (Table 4.1); the use of a loom is predicated on access to wool, and implies either ownership of sheep or availability of cash for its purchase. Some houses without vertical looms are inhabited by older women who do not know how to weave pile carpets, but who occasionally produce a variety of flat-weave pieces on horizontal looms set up in unroofed areas. The absence of a vertical loom, therefore, need not reflect comparative poverty or absence of

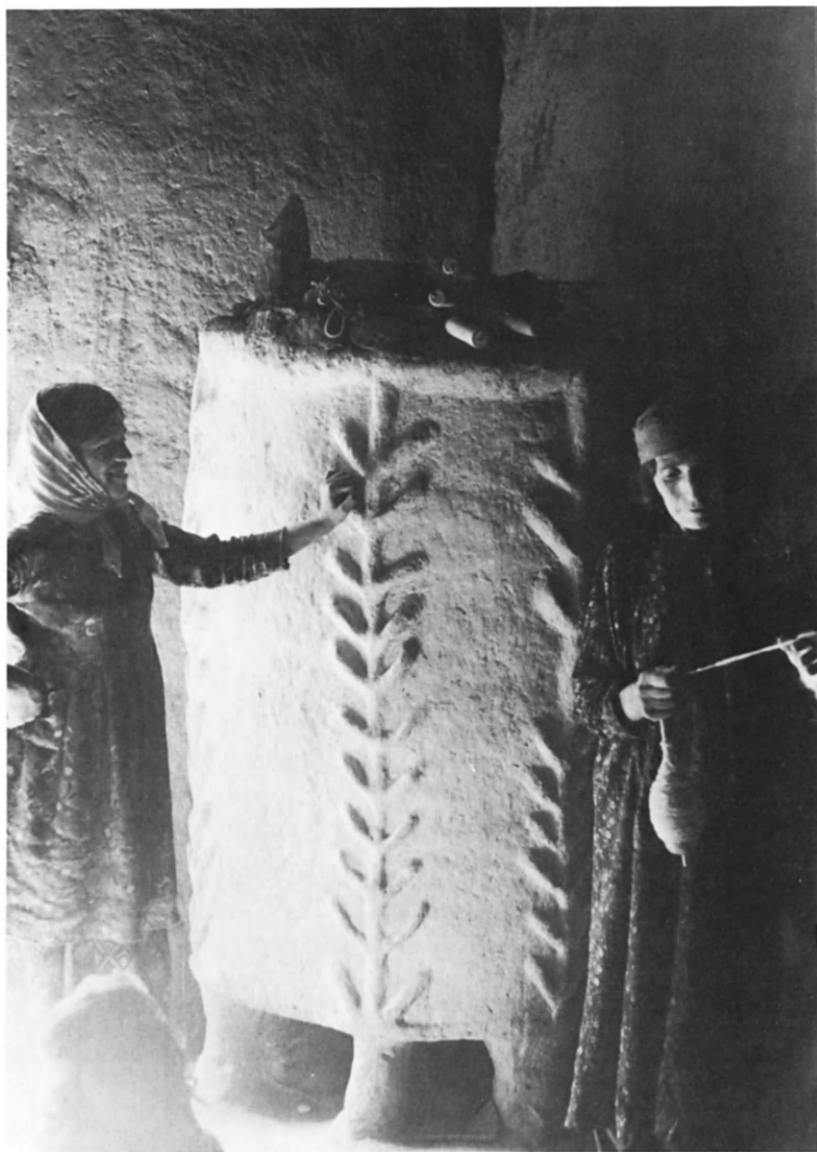


Figure 4.11. Grain bin decorated with appliqué “tree of life” motif. When photographed, this bin was approximately 20 years old.

sufficient sheep, and there is no significant association between wealth quartile and presence or absence of a loom. Most vertical looms in Aliabad are located in kitchens, but they are sometimes situated in the foyer, and rarely in a living room. Only one of the village's 22 looms is situated in a second-story room; this household's head volunteered the opinion that because looms are heavy, his was in an unusual location, and he explained that it was possible only because the underlying flooring consisted of brick vaulting.

Kitchen floors are not covered with pile carpets, flat-weave rugs, or felt mats unless the kitchen doubles as a living room, and is thus also used for eating, sleeping, or entertaining. They are, however, plastered and well smoothed, and may also be covered with a watery whitewash (which seems to be rare). Much more often than its floors, a kitchen's walls are coated with a whitish film; over the years, many walls have taken on a grayish cast from smoke. As in parts of Africa, soot accumulation may minimize the number of insects and vermin attracted to such areas (Denyer 1978:21). The door to the kitchen provides most of its ventilation, but in some cases there is also a small hole in the roof and/or a window, which may be merely a tiny hole placed high in the wall separating the kitchen from the courtyard (Figure 4.8). Kitchen walls generally have several niches (for lanterns and storage of food and household utensils), which are not as carefully finished as those in living rooms. In some compounds, the household's beehives are set into kitchen walling.

The kitchen is the domain of women; the living room, of men. Whereas kitchens are invariably located on the ground floor, living rooms may be located on either the ground floor or the second floor. In Aliabad, second-story rooms are considered cooler, since they catch breezes that do not readily penetrate ground-floor rooms, which lack windows facing onto the village's open areas (DePlanhol 1968). When a compound has only one second-story room, it is invariably a living room; additional second-story rooms may double as areas for light storage (Figure 4.7). Watson (1978, 1979) refers to such rooms in Hasanabad as utility rooms.

Living rooms are used for a range of activities not associated with food preparation. Perhaps the most important social activities centering on the living room are eating and entertaining.

As the family's most public room, the living room is the repository for important and prestigious possessions: photographs and other mementoes of a trip to Meshed, photographs of family members, magazine illustrations of religious or popular figures, mirrors, electronic equipment, their best carpets, clocks, brass and silver trays and other costly utensils, goldfish purchased in Tehran at the New Year, and the like. Niches in living room walls are used to store some of these items, and may be covered with a decorative cloth hanging. Metal trunks containing stored clothing may be located in the living room which, in a few cases, also contains a grain bin (e.g., 19; see also Figure 4.12). A compound's

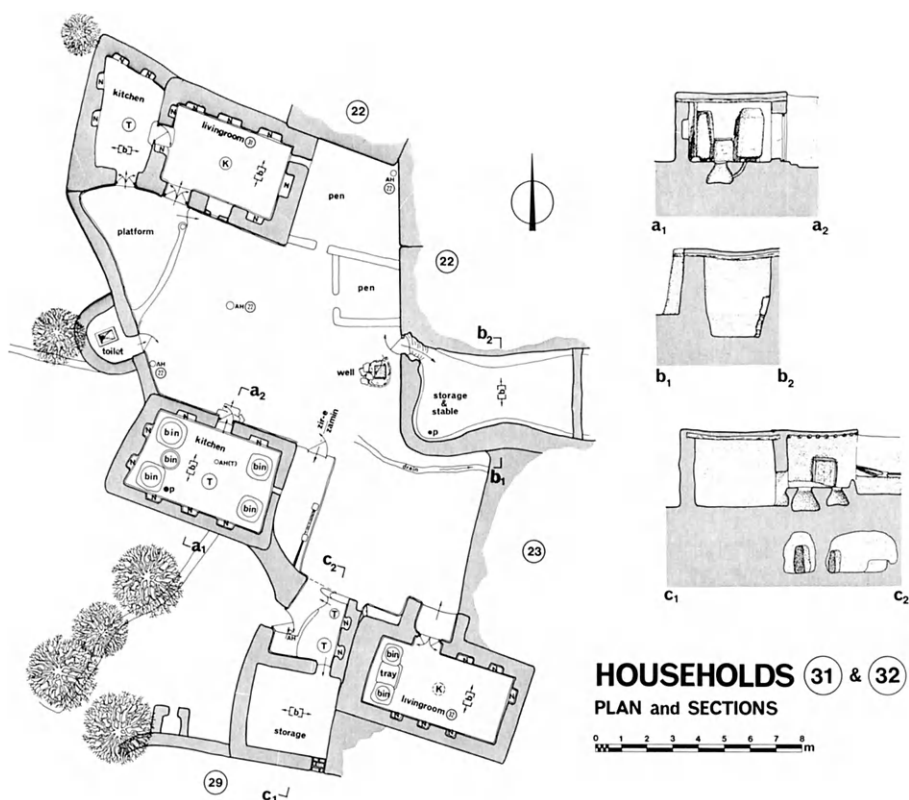


Figure 4.12. House 31/32, Aliabad (plan). T: oven, K: hearth, N: niche, AH: air hole (for oven), P: wooden post, b: horizontal (beam) ceiling. Family 31 sleeps in the living room to the north, family 32 sleeps in the living room to the south; in very warm weather, some household members sleep on the platform. The underground stable of household 31/32 is shown in Figure 4.14.

largest and most decorative windows are found in its living room(s). Pillows, bolsters, or rolled-up bedding are placed against the walls for the customary seating arrangement, which does not involve chairs or stools.

Living rooms are often carefully whitewashed. In a few houses they are ornamented in other ways, such as with geometric appliqué decorations (48), a few tiles incorporated into the wall plaster (20), or spattered blue paint (1).⁴ In addition to these surface features, the living room wall is also often hung with seeds of dried wild rue strung in decorative triangles above pendant strings and with attached bits of paper and cloth, thought to ward off the evil eye. Other

⁴In this room, the metal window frame is also blue. This color is thought to have the property of protection against the evil eye, and is frequently seen throughout Southwest Asia in tiles, glazed beads, ceramics, and architectural elements, as well as in more perishable garments and rugs.

ornamental items in living rooms that might be incorporated into the archaeological record include religious items (the family's copy of the *Quran*, if it has one), pictures of family members or of the saint Ali, or mementoes of a pilgrimage. Living room floors, like their walls, are finely plastered, and they too may be coated with whitewash, although sometimes the wall's whitewash extends only partly onto the floor, most of which is covered with a felt or flat-weave rug, a carpet, or a reed mat. A few living room floors have been burnished with river cobbles.

Like the ceilings of kitchens, those of living rooms are flat. They consist of reed mats, twigs, and mud set between and above horizontally laid beams. Unlike kitchen ceilings, however, those of living rooms often have a lower layer, consisting of strips of reed matting or of cloth, which masks the structural elements. Ceilings of both living rooms and kitchens are from 2 to about 2.5 m above their floors.

Unlike kitchens, which are heated by their ovens, living rooms derive their heat from hearths. The hearth is a plastered circular depression some 25 cm deep located in the middle of the living room floor. It is plastered annually, at the end of each winter, by which time the clay has become reddened and cracked. During the summer, when it is not in use, the hearth is filled with a solid plug of clay, and the entire feature is covered with a rug. In winter, a low table-like wooden frame (*kursi*) is set over the hearth, which becomes the focal point around which people eat and sleep (quilts and tablecloths being laid over the wooden frame). In some houses the hearth is surrounded by four small circular depressions into which the feet of the portable superstructure are set (see Figure 4.18 below). Hearths of this type are reported throughout the Zagros (Hansen 1961; Mokri 1961) and similar features have been found at a nearby prehistoric site (Hamlin 1974). A shallow portable metal brazier with burning charcoal or dung-cake fragments, also used to heat brewing tea, serves as a heat source, and is shifted from room to room as needed.

The number of living rooms and their spatial relationships might be used to reconstruct tentatively the number and type of families in a house. In Aliabad, almost all living rooms and those kitchens which are also used for sleeping are independent, in that they need not be entered through another room. In the few cases with two contiguous living rooms, the one that must be entered from the other is used by children.⁵ When living rooms must be entered via a kitchen, the kitchen may also serve as a sleeping area (for a resident widow, as in 64), but more often only one nuclear family resides in the compound and all of its members sleep together in the living room.

⁵These are 2, 60, 77/78, and probably 50–52. In two other cases (33 and 64), a living room is entered from the kitchen. Relevant data are not available for 5 of Aliabad's 67 compounds: 11, 12, 65/66, 75/76, and 79/80. However, it is clear except in the case of 65/66 that in these compounds each family has its own living room (with a separate entrance). In 65/66 it is very likely that one of the families sleeps in the kitchen, at least occasionally.

In most ($N = 54$) of Aliabad's houses, living rooms, and sometimes their kitchens as well, are entered from a small, three-sided foyer. The foyer's open side faces onto the compound's courtyard regardless of whether it is on the ground floor or adjoins a second-story living room. Although these areas function primarily as passages, they sometimes double as temporary storage areas; in a few compounds, bins or looms are located in the foyer. On very warm days, villagers may carry rugs out to the foyer and eat their main meal there. Because such areas are generally shady and cool, women often spin wool and occasionally prepare tea or food in them.

In addition to kitchens and living rooms (whose functions are, in a few compounds, combined in a single room), all of Aliabad's houses have at least one storeroom, and some have several. In compounds with more than one storeroom, they are generally functionally differentiated. Thus some storerooms located on ground-floor level are used exclusively for dung cakes, and others for fodder. There are also general-purpose storerooms, corresponding to Watson's utility rooms, used for a wide range of dry goods and some foods. Such rooms may contain the family's clothing, household utensils, some agricultural equipment, piles of wool and cotton, metal or wooden storage trunks, quilts and spare bedding, wooden hearth frames, unused vessels, lamps, Coleman stoves, and goatskin bags used in processing milk. One such second-story storeroom (in 1) was described as having been built in order to provide a wall in which 40 beehives could be installed. Regardless of their location or special function, storerooms generally have several niches, although stored items also rest or are piled directly on the floor. The walls and floors of storerooms are somewhat more carefully finished than are those of stables, but they do not reflect the care devoted to surfaces in kitchens and living rooms. Storerooms are often windowless. Their ceilings are flat, except when a second-story room has been built over a storeroom, its beams removed, and a new, vaulted ceiling of unbaked brick substituted.

In a few compounds, ground-floor storerooms contain a large pit used exclusively for barley storage. Such pits are cylindrical, measuring approximately 1 m in diameter and 1–1.5 m in depth. The pits' sides are created by excavating into the earth on which the house is built, and they are not plastered or treated in any diagnostic way. Barley is piled in such pits, whose tops are then sealed with a layer of chaff-tempered mud plaster. Villagers say that barley stored in this fashion may be usable for up to 3 years; similarly long-term grain preservation is reported for comparable pits used as much as 1000 years ago in Iraq (el-Samarraie 1972:64). Two barley pits located in the courtyard of an old house (22/24) are currently used as garbage dumps. The functions of other built-in features also change; such facilities as beehives, small bins, or old ovens are sometimes used for temporary storage of fruit, legumes, or wool.

In some cases, storerooms are entered directly from the street or alley, permit-

tting the farmer to bring material (usually fodder) directly from his field or threshing floor into the storeroom. Entrances to such storerooms may be through a small irregularly shaped doorway set high above alley level; after the storeroom is filled, the doorway is somewhat sloppily plugged up with bricks and mud (see Figure 4.2). Similar periodic blocking of doorways is reported for Tell Toqaan, where different compound entrances are blocked alternately in summer and winter, primarily to facilitate access of farmers carrying produce from fields (Sweet 1960:78). In Aliabad, the compound entrance to at least one house (Figure 4.7) had been relocated to permit easier access to a fodder storeroom across the alley. A few of the storerooms entered from the street are used exclusively for fodder and are permanently without roofing (for example, 53). In such cases fodder is piled within the walls and covered with a layer of watered-down mud, which is chipped off as the fodder is consumed during the wetter, colder months.

As Figure 2.1 and Table 4.1 indicate, several storerooms are neither entered from nor contiguous to their owners' compounds. In such cases⁶ storerooms are adjacent to buildings across an alley from which they are entered. Should such structures be preserved archaeologically, it might be possible to establish both their function as storerooms and the fact that they were structurally discrete, but attribution of ownership would be impossible. The spatial dispersal of households' rooms suggests both that archaeologists might do well to reevaluate the common assumption that contiguous rooms are owned or used by a single economic unit, and that increased attention to patterns of circulation among archaeological rooms might be fruitful.

Most households owning livestock shelter them in stables, but in those compounds without stables animals are kept in unroofed courtyard pens and in subterranean shelters; theoretically, some might also, occasionally, be kept in storerooms, and in neighbors' stables. Like all kitchens and many storerooms, stables are found only on ground-floor level. Such rooms, entered from the courtyard, are used exclusively to shelter and feed animals. The walls of stables are not plastered or whitewashed, nor are their floors, which tend to be irregular and dung-coated (Figure 4.13). Stable floors are periodically swept clean, and the dung that has accumulated is sun-dried and eventually used for fuel. The chief diagnostic built-in feature of the stable is a trough; these are not found in other rooms, although they are sometimes found in courtyards. In contrast to storerooms and dwelling rooms, stables that were built to function as such do not

⁶Compounds 17, 23, 33, 53, 58, 68/69, 70, and 77/78. The social function of such spatial dispersal of households' rooms is a complex issue and causes may vary from one area to another. Antoun (1972:55) implies that the same situation may exist in Kufr al-Ma, although the main thrust of his argument is that households are economic units, and that these are not necessarily coterminous with dwelling units; there, some dwellings (even those consisting of a single room) may be inhabited by more than one household. Data from Baghestan, on the Iranian plateau, indicate that many households' rooms are dispersed throughout the settlement (Horne 1980b).



Figure 4.13. Troughs and floor in an Aliabad stable.

have many niches and generally lack windows. Some stables are recycled kitchens or storerooms. In such cases, where a pit or oven is located in the room, it is filled in; the ceiling beams of the original room are removed, and a new vaulted roof of unbaked mud bricks is built.⁷ It is said that if a second-story room is to be built over the stable, the vaulting as well as added walling provide a stronger support than would a horizontal ceiling of wood and mud. In some compounds, while cattle continue to be stabled above ground during the winter months, caprovids are moved into a subterranean stable (the *zir-e zamin*, or “under ground”; see Figure 4.14, this volume, and DePlanhol 1960, 1968).

Many compounds have a low-ceilinged, irregularly shaped subterranean tunnel dug beneath them and entered from a ramp located, almost invariably, in the courtyard (the sole exception, no longer in use, is the entrance to a *zir-e zamin* situated just north of 41). A long, narrow tunnel terminates in a small underground stable containing troughs and a niche or two for lanterns. Some of these tunnels are arranged in complex networks, and some extend beneath neighbors’

⁷One bright and fairly well-traveled adolescent, discussing variations in village roofing, offered the opinion that vaults were acceptable for livestock, but that people need the expansiveness and height of flat ceilings. He maintained this position even when reminded that elsewhere in Iran (and in other Middle Eastern countries) vaulting is the prevalent mode of roof construction for rooms of all types.

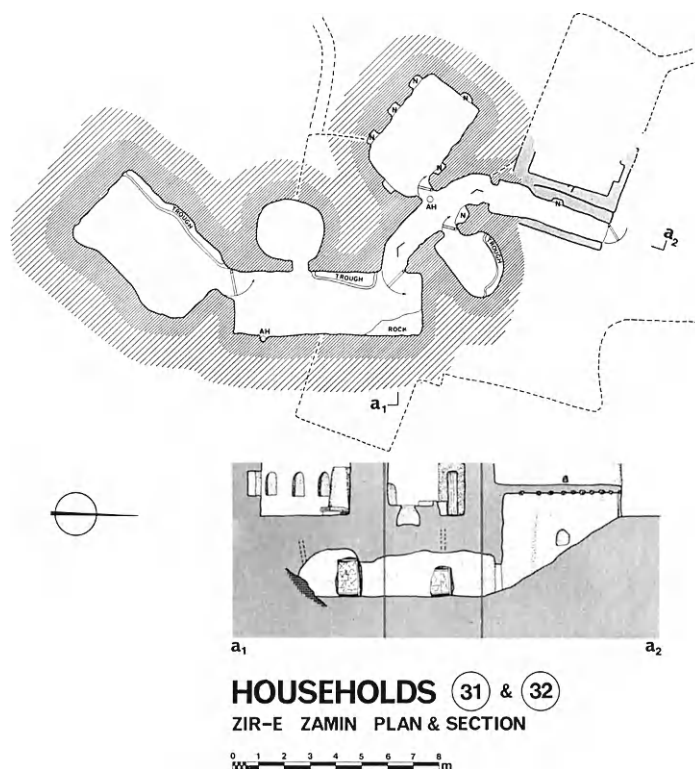


Figure 4.14. House 31/32, subterranean stable (*zir-e zamin*). AH: air hole.

compounds. In one house (31/32) stone has been used to shore up the earth excavated to make the tunnel's walls but, in general, no building materials are used to prevent collapse or cave-ins, although villagers are painfully aware that they live in an active earthquake zone.

The compound courtyard is the location of various structural features in addition to entrances to underground stables. These include poultry coops and troughs for livestock, as well as unroofed or flimsily and partially roofed pens used for sheep and goats during warm nights. Troughs located in courtyards, like those in stables, are made of unbaked bricks and/or packed mud. They are built up from the courtyard surface and abut either the enclosure wall or an outer wall of a pen or a room. They vary in length, are generally less than .5 m in height, and are often about 30–40 cm wide. One household (39) has installed a cement trough in the middle of its courtyard. Coops are often domed *chineh* structures of about .5 m both in height and diameter; they have a small doorway through which poultry come and go, a small ventilation hole in their ceiling and, in some

instances, small perforations in their walls as well (Figure 4.15). Some villagers have used broken water jars, or combinations of mud and sherds from such jars, to create coops. Although most coops are located in courtyards' corners, some are set atop the low walls of livestock pens. The outdoor oven, often but not always set into a plastered platform rising as much as 1 m above the courtyard floor, is situated in the courtyard corner. When a compound has a well, it is generally located in the courtyard. Wells are usually covered with a metal lid or surrounded by stones, and often have a shallow drain leading away from them. In at least one compound (37), this drain is very neatly lined with stones. Some courtyards also have a low platform⁸ on which household members sleep in the warmest weather if they do not have a sufficiently large foyer or second-story balcony (see Figure 4.12). In a few houses a low bordering ridge of well-plastered packed mud demarcates such seasonal sleeping areas, and its terminal flat bulb-like feature provides a temporary resting place for lamps. Finally, a few courtyards also contain trees, some of them surrounded by a low circular ridge of mud designed to prevent runoff after watering.

Courtyard surfaces vary considerably (see Figure 2.3). All are of hardened earth; some also have localized patches of river gravel, pebbles, and cobbles. The cleanliness of such surfaces varies with housewives' tolerance for dirt and with activities carried out in courtyards, which are generally swept daily. Within a courtyard the presence of light roofing over some specialized areas (e.g., ovens) and over the compound gate may minimize erosion associated with precipitation. The metric area of a courtyard and the height and orientation of walling rising above it may combine to affect the amount and timing of direct sunlight reaching courtyard surfaces; this, in turn, may be related to variations in courtyards' surfaces, some of which seem riddled with perpetually damp (and slightly sunken) areas, perhaps because they received limited (or early morning) light.⁹ Only one courtyard in Aliabad (21) is so topographically irregular as to resemble "outdoor" surfaces like those seen in some village commons.

In addition to their diagnostic surfaces and built-in features, courtyards are also used for temporary storage. Beams slated for future use may lean against a corner where the household's threshing sledge components, plow parts, shovels, winnowing forks, and ladders may also be piled carelessly. Flat-weave rugs and miniature pile carpets (for babies) are made in courtyards; the small holes into which such looms' stakes are set might be archaeologically detectable. Shearing, milking and milk processing, cooking and baking, and felt manufacture all take place in courtyards, but except for the ovens associated with food preparation there would probably be little or no archaeological evidence of these activities because of the regularity with which courtyards are swept clean. During the warm

⁸These are in houses 4, 31/32, 54–56, 73, and 81.

⁹Claus Breede, project architect, first suggested that limited sunlight might affect courtyards' surfaces. I did not collect data on this form of variability in outdoor surfaces, and the idea remains an untested hypothesis.



Figure 4.15. Poultry coop in a dung cake storage area, Aliabad.

months, the courtyard is used only for short periods, rather than serving as a locus of extended activity. The amount of time spent in courtyards during the summer, and the kind and number of activities carried out in them, may vary with the amount of shade available.

Courtyards are areas through which people walk from one room to another, and from which guests are quickly ushered on their way to the living room.¹⁰ They are entered from the alley through a gate or door set into the compound enclosure wall (Figure 4.16). Courtyards are households' most public areas, and those in which a great diversity of activities occurs, but it might be difficult to develop archaeological reconstructions of these activities. Although one might predict a greater diversity of artifacts on the excavated surfaces of courtyards than in compounds' other areas, the short duration of associated activities in combination with cleaning practices may preclude the accumulation of a comparatively more internally diversified artifact assemblage in courtyards (indices of diversity are discussed by Fish *et al.* [1978] and by Yellen [1977], among others).

In some compounds a plastered brick stairway built against the inner face of one of the courtyard's walls is used to reach the roof (Figure 4.17). Some roofs are attained by climbing up ramplike features that appear to be the decayed remnants of old rooms' outer walls (e.g., 22/24); residents must skirt their compound's enclosure wall to climb the ramp (see Figure 4.9). In most cases, however, the roof is reached by wooden ladders propped against the courtyard's inner wall. Like courtyards, roofs are used for temporary storage. Foods that are being processed during one season for consumption in another are dried on the roof; so are twigs, thistles, and other forms of brush used for fuel and fodder, and straw is sometimes dried out on the roof before being stored within the house. Beams and other poles and the portable *kursi*, as well as parts of larger agricultural implements, are commonly piled on rooftops during rainless months.

In concluding this description of Aliabad's houses, one should mention two additional room types. The first is the latrine, not present in all compounds (see Figure 2.1 and Table 4.1). In several instances, small unroofed latrines situated at the village's periphery are routinely shared by two or more households. Others use nearby orchards or gardens. In one case (20), the latrine is entered from the alley although the room is attached to the compound whose household built it. In most cases, however, the latrine is an unroofed and usually doorless *chineh* structure located in a distant corner of the compound courtyard. The chief diagnostic feature of the latrine is a cylindrical shaft some 20–25 cm in diameter

¹⁰Compound gates are often but not always locked when residents are not present. Even if a door is open, nonkin wishing to enter a compound knock loudly on the gate and shout "Y'Allah" or "Y'Ali," or ask the rhetorical question "Don't you want guests?" The response is invariably a loud invitation to enter. In the case of neighbors, visiting is sometimes expedited by passing from one roofed area to a roof in the adjacent compound; a shouted warning is then usually issued to announce the impending arrival. It is possible to traverse an entire block within the village by walking across its rooftops, and many villagers can, even from childhood, precisely identify individual rooms in neighbors' compounds from a mental rooftop map.

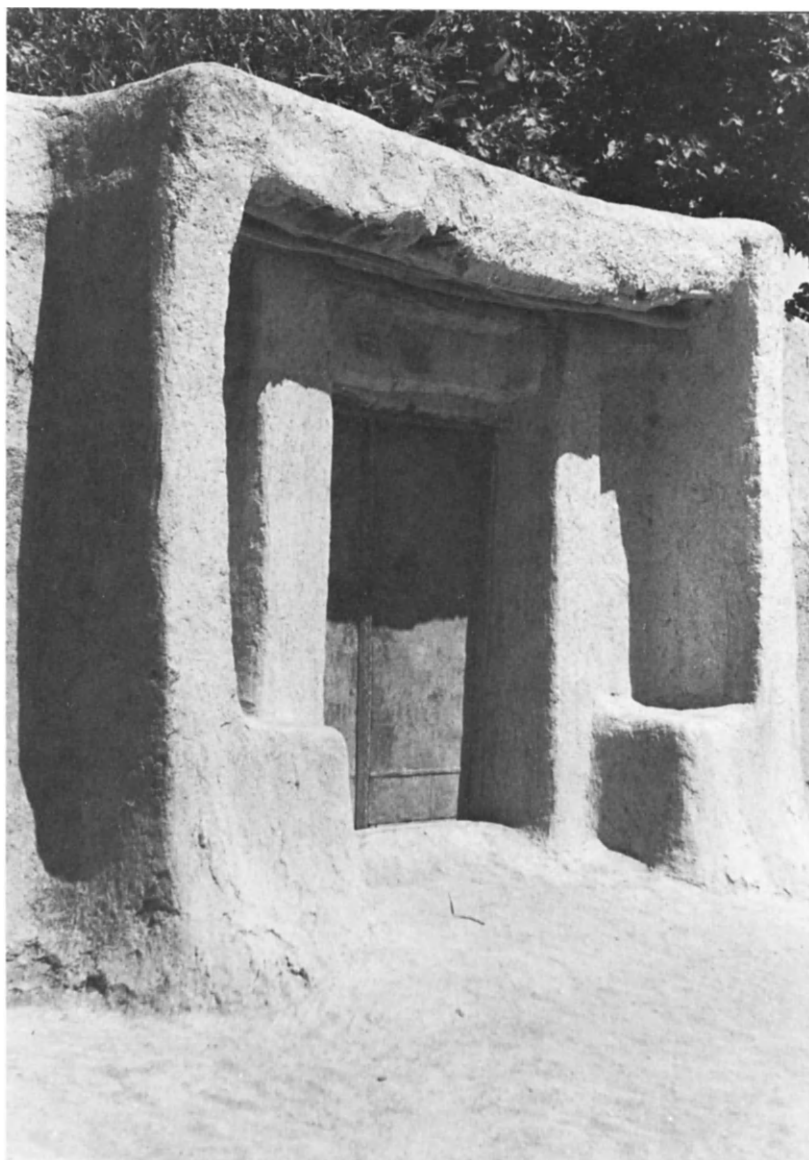


Figure 4.16. Entrance to house 12, Aliabad. With its recessing and benches, this is one of the most elaborate compound entrances in the village. Note surface of adjoining thoroughfare, referred to as an “avenue” rather than an “alley.”



Figure 4.17. Stairway in courtyard of house 82 (storeroom door to right).

dug several meters into the soil beneath the compound; in at least one case, this hole has been surrounded by cement.

A second and even rarer room type is the “shop.” There are five shops in Aliabad.¹¹ One, built and used by the compound’s former occupant, currently stands unused and empty. In all cases, these rooms are entered from the alley, and in most there are additional doors giving access to the courtyard of the compound to which they are attached. As is the case with some storerooms, one shop (6) is attached to another household’s compound. Shops have many niches, some have one or two platforms of plastered mud brick, and all lack features characteristic of other room types (such as ovens, hearths, bins, or troughs). Most shops lack windows. They all have a small inventory consisting of such perishable items as matches, cigarettes, sugar, tea, and candy. Unlike several shops in the nearest and substantially larger village, they do not sell meat, or large quantities of other food staples. A range of items (including produce, cloth, spindle whorls, glass products, and ceramic vessels) not stocked in these shops are purchased with cash from itinerant merchants. Many transactions in Aliabad’s shops involve barter; buyers sometimes pay in recently harvested cereals or legumes. Its

¹¹They belong to households 6, 40, 50–52, 60, and 83.

TABLE 4.1
Architectural Details, Allabad Households^a

Household	Coresiding families ^b	Area (m ²)			Rooms (number)				Features				
		Compound ^c	Courtyard	Dwelling ^d	Second story	Living rooms	Rooms (number)			Pens in courtyard	Latrine in compound	Well in compound	Shop
							Kitchens ^e	Storerooms ^f	Stables ^g				
1	3	141	68	73	+	2	1*	5*	3	+	+	3	+
2	1	170	45	65	+	2	1	2	1	+	+	3	+
3	2	253	82	53	+	2	1	3	3	+	+	2	+
3a	1	194	89	n.a.	+	n.a.	n.a.	1	n.a.	+	n.a.	n.a.	n.a.
4	1	89	20	61	+	1	2	1	1	+	+	3	2
5	1	120	50	49	+	2	1	1	1	+	+	3	2
6	1	251	105	50	+	1	1	2	1	+	+	3	1
7	1	112	57	39	+	1	1	1	1	+	+	3	1
8	1	182	76	49	+	1	1	2	1	+	+	3	2
9	1	141	64	40	+	1	1	1	1	+	+	3	2
10	1	301	107	52	+	2	1	1	1	+	+	1	2
11	2	449	222	n.a.		n.a.	n.a.	n.a.	n.a.	n.a.	+	n.a.	n.a.
12	1	346	213	n.a.		1	1	2	n.a.	+	+	n.a.	n.a.
13	1	252	152	75		2	1	1	2	+	+	1	3
14	1	448	151	43	+	1	1	1	2	+	+	2	3
15	1	155	57	48	+	1	1	1	1	+	+	4	2
16	1	566	110	52		1	1	2	2	+	+	2	2
17	2	453	122	95	+	2	2	3*	3	+	+	8	4
18	2	161	51	61	+	1	1*	2	1	+	+	4	3
19	1	250	166	53		1	1	2	1	+	+	6	3
20	1	141	55	43		1	1	1	1	+	+	2	2
21	1*	226	153	29		1	1*	2	1	+	n.a.	3	2
22/24	3*	756	226	135	+	3	2	5	n.a.	+	+	6	2
23	2	215	75	55		2	1	3*	n.a.	+	n.a.	3	3
25	1	217	77	53	+	1	1	3	1	+	+	3	2
26/27	2	304	124	81	+	2	1	3*	1	+	+	4	4
28	1	212	124	55	+	1	1	2*	1	+	+	5	2
29/30	2	160	60	65		2	1	1*	n.a.	n.a.	+	2	2
31/32	2	319	139	97		2	2	1	1	+	+	7	4
33	1	382	347	35		1	1	1*	1	+	+	2	2
34	1	583	470	61	+	1	1	2	1	+	+	1	1
35/36	3	345	155	50		3	3	1	1	+	+	n.a.	n.a.
37/38	2	275	65	120		2	3	3	1	+	+	6	5
39	2*	280	108	43		1	1	3	1	+	+	5	3
40	1	159	86	18		1	1	3	1	+	+	2	2
41/42	2*	165	70	67		1	1	1	1			5	4
43	1	125	74	41		1	1	1	1	+	+	2	2
44/45	2	199	86	42		2	1	2	n.a.	+	+	2	3
46	1	152	46	35		1	1	2	1	+	+	4	3
47	1	417	151	122	+	2	3	4*	2	n.a.		5	6
48	2	142	42	75	+	1	2	4*	1	+		6	4

49	2*	115	22	25		1	1*	2		+		3	3
50-52	3	475	91	99	+	3	2	6*		+		7	5
53	1	312	100	65		1	1	5*		+		3	2
54-56	3	366	58	108	+	3	2	6		+		6	4
57	1	101	49	23		1	1	1		+		4	2
58	1	84	37	27		1	1	3*		+		5	2
59	1	72	18	25		1	1	2				5	2
60	1	194	55	59	+	2	1	3		+		1	3
61	1	58	34	12			1*	2				1	2
62	1	42	13	25			1*	1				1	1
63	1	96	28	48	+	2	1	1				2	3
64	2*	124	14	80	+	2	1	2		+		2	2
65/66	2	85	22	40		1	1*	2*		+		n.a.	n.a.
67	2*	146	51	49		2	1	5*		+		2	3
68/69	2*	172	43	49	+	2	1	2		+		2	4
70	1	147	65	44	+	1	2	2*		+		2	1
71	1	78	14	21		1	1	1		+		2	2
72	1	115	37	38	+	1	2	3		+		5	2
73	1	176	36	33		1	1	2*		+		2	2
74	1	142	28	62		1	2	1		+		3	3
75/76	2	638	184	n.a.	+	n.a.	n.a.	n.a.		n.a.		n.a.	n.a.
77/78	2	136	40	54	+	3	2	4*		+		2	3
79/80	2	1358	763	n.a.		(32)	(22)	(57)		n.a.		n.a.	(47)
81	1	255	95	40		1	1	5		+		2	3
82	1	362	213	38		1	1	3		+		5	3
83	1	258	74	79	+	3	2	3		+		3	2
													+

^a Where a number is not given for an item, a plus indicates its presence; a blank, its absence; n.a., data not available.

^b A family is defined as a husband and wife (with or without unmarried offspring), or a surviving member of such a unit. Households including widows (and in some cases their unmarried offspring) are indicated with an asterisk. Details are shown in Figure 2.2.

^c Figures do not include storerooms located elsewhere in the village; Q1 = 42-141 m²; Q2 = 142-194 m²; Q3 = 195-312 m²; Q4 = 313-1358 m². Details are shown in Figure 2.1.

^d The sum of all living rooms and kitchens; figures include walling.

^e In some compounds, one kitchen is sometimes used by household members as sleeping quarters; these are indicated with an asterisk.

^f Some households have storerooms adjacent to their compound but entered from the street; others have storerooms that are not contiguous to their compounds, and also entered from the street. Such households are indicated with an asterisk; details are shown in Figure 2.1.

^g Figures do not include subterranean stables (*zir-e zamins*).

^h Food is sometimes stored in gunnysacks and other containers even in compounds with bins; not all bins are the same size.

ⁱ Not all ovens are used; some are used not for cooking but for storage.

shops do not appear to be significant meeting or loitering places for Aliabadis, in contrast with similar shops in towns like Kangavar.

In summary, the compounds occupied by Aliabad's households are primarily although not exclusively residential in function. Such areas as courtyards, living rooms, and kitchens are used for a range of activities, but the portable material evidence of these activities may not be incorporated into the archaeological record of this settlement. In contrast, built-in features (such as ovens, bins, hearths, and troughs) and some evidence of semipermanent features (like looms' postholes) are likely to be preserved. It is also probable that diagnostic differences in both horizontal surfaces (particularly the sometimes marked variation in flooring) and wall coatings will be preserved archaeologically, and that differences among them may be detectable. It is thus likely that rooms could be identified at least in terms of their primary functions.

Houses in Aliabad have at least three functionally differentiated areas: the unroofed courtyard, a room for storage, and a room for sleeping, cooking and eating, and entertaining. Most houses have more than two rooms, and many have more than two rooms of a particular type. In some compounds, the more general function of storage is served by several rooms, each of them used to store different things. In most compounds, activities centering around food are divided between two or three rooms (kitchen, living room, and storeroom) with differing formal attributes. Some compounds have more than one stable, and some formal differences among stables are related to the fact that they shelter different species (for example, donkeys and cattle are stabled above ground; subterranean stables imply the presence of sheep and/or goats). A comparable range of activities is carried out in all of Aliabad's compounds. Formal dissimilarities among houses, therefore, cannot be automatically attributed simply to the differential occurrence of activities within them.

In Aliabad, not all houses have the same types of rooms, or the same number of rooms (the mean number of rooms per compound is 5.5, and the median is 5; the range, however, is 2-12; see Table 4.1). In excavating the archaeological remains of such a village, it would be desirable not only to ascertain what the range of activity areas in a particular compound might have been, but also to attempt to establish the nature and extent of variation among compounds. In the contemporary settlement, such variation is related both to differences in households' economic statuses and to differences in the number and relationships of residents.

RESIDENTIAL ARCHITECTURE AND POPULATION

For a variety of reasons, archaeologists often wish to reconstruct the population size of areas that they have surveyed or of sites that they have excavated. Many discussions of prehistoric population center on the role of demographic

change in changing land use patterns, technological change, and sociopolitical transformations (Hassan 1981). In addition to theoretical discussions of demographic change framed in large-scale, multiregional terms (Cohen 1977; Smith and Young 1972), the literature includes several attempts at estimating prehistoric population sizes in more narrowly defined geographic areas. Such estimates have most often had as an ultimate objective the comparison of different periods within a given region, generally in order to evaluate hypothesized relationships between demographic and other transformations (Adams 1965; Adams and Nissen 1972; Blanton 1972; Johnson 1973; Parsons 1971). In these and other cases, population estimates have most often been based on archaeological site surveys rather than on the excavation of individual sites. Some of the problems inherent in such efforts are discussed elsewhere (Kramer 1980) and are taken up briefly in Chapter 5.

Other prehistoric population estimates have been based on excavated data. These include human skeletons and other mortuary remains (Ammerman *et al.* 1976; Asch 1976; Howells 1960; Masset 1980), food residues (Ascher 1959; Wheat 1972), artifacts related to food preparation, consumption, and storage (Cook 1972; Turner and Lofgren 1966), and architectural features interpreted as dwellings (Cook and Heizer 1968; LeBlanc 1971; Naroll 1962). In the following pages, some of the relationships between Aliabad's architecture and its population are discussed, as is the utility of various architectural features as estimators of archaeological population size and composition.

A variety of cultural values are reflected in the use of residential space in Aliabad. One of the most important of these is a preference for virilocal extended households. Of Aliabad's 67 houses, 24 (36%) are occupied by more than one nuclear family, and most of these are coresiding fathers and sons. Villagers feel that each married son and his family should have a separate room so that, ideally, the number of living (sleeping) rooms is the same as the number of coresiding nuclear families. When a son marries and continues to reside with his parents, a new room is added to the compound, or an existing room is converted from some previous function. For example, it was said that when the eldest unmarried son in household *I* married, a second-story dry-goods storeroom would be converted to a living room by excavating a hearth in its floor and creating another door (see Figure 4.7).¹²

Given that stables and storerooms are not habitation areas, and that their walls, floors, and features would probably permit their identification in many archaeological contexts, they do not seem particularly relevant to an analysis of relationships between compound architecture and population. In contrast, the numbers and sizes of dwelling rooms (as well as total compound area and such

¹²Architecturally, it will be feasible in this case to build a separate stairway in the courtyard along this room's outer wall, to create a private entrance; otherwise, the new couple would have to pass through the sleeping quarters of the groom's parents and unmarried siblings.

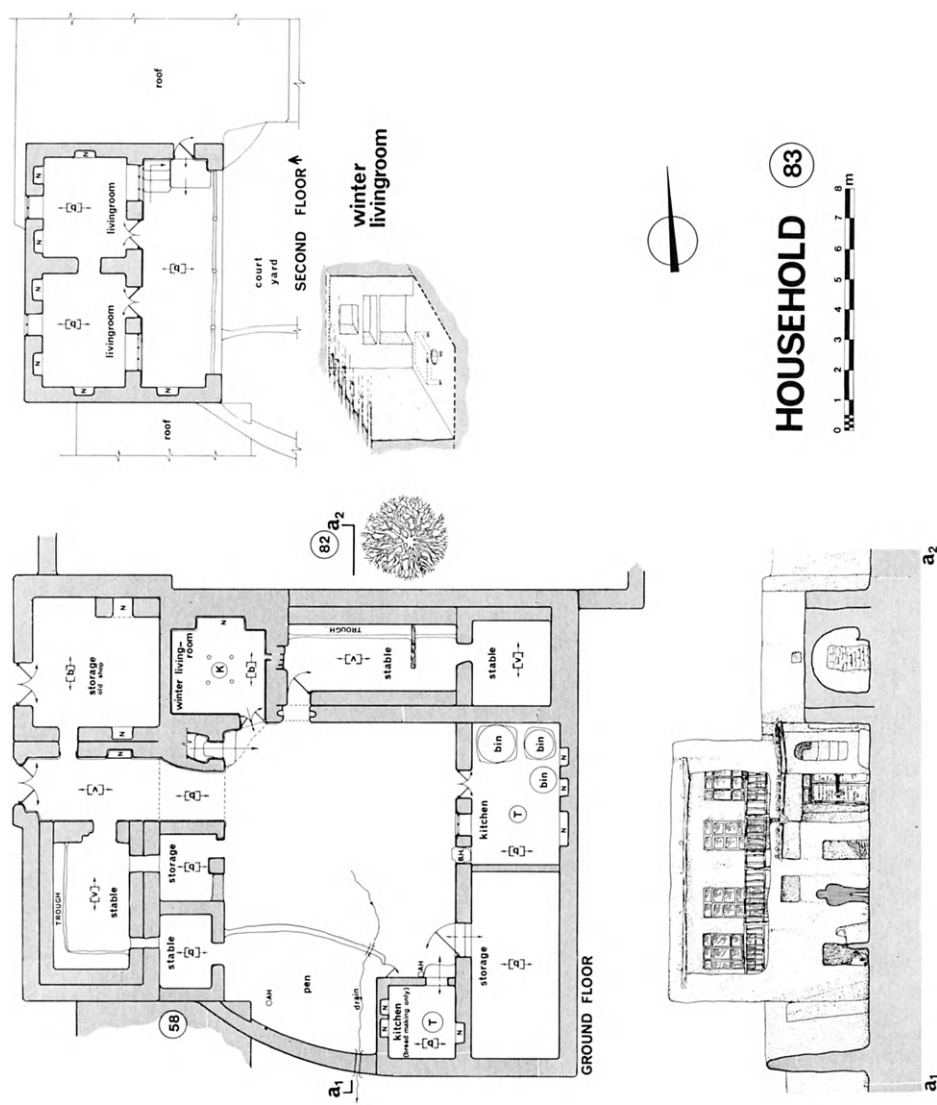


Figure 4.18. House 83, Aliabad (plan and section). T: oven, N: niche, K: hearth, AH: air hole, BH: beehive, b: horizontal ceiling, v: vaulted ceiling.

built-in features as bins and ovens) would seem pertinent to the reconstruction of household size and perhaps composition.

Even the classification of contemporary dwelling rooms is not without its problems, however. For example, in Aliabad there are several compounds in which either an individual (a widowed mother) or a nuclear family sleeps in a kitchen (see Figure 4.6). Compound 1 (Figure 4.7) is occupied by three nuclear families: two of them occupy living rooms, and the third sleeps in the kitchen, using the residual warmth of the oven in lieu of a hearth during the colder months. In Aliabad, nine rooms are used in this way; functionally, they are probably best designated "living room/kitchens." Formally, these kitchens lack attributes (other than mats, rugs, or other portable items) that reflect the additional function of sleeping areas.¹³ Given the sleeping pattern outlined above, the number of hearths in a compound may reflect the number of resident nuclear families. However, because it may not always be possible to identify dual-purpose kitchens either ethnographically or archaeologically, the number of nuclear families estimated on the basis of archaeological hearths should be viewed as the low end of a possible range, and the number derived by counting all kitchens and living rooms together considered maximal.

There is a strong positive relationship between the number of coresiding families and the number of living rooms in a house. However, the association is slightly stronger among the landed segment of the population than among the landless, because more nuclear families in the latter group sleep in kitchens.¹⁴ Eleven of Aliabad's houses have more living rooms than resident nuclear families; in these cases, the second living room is used as children's sleeping quarters, for occasional overnight guests, or for dry goods storage.¹⁵ In a few of these cases (e.g., 83; see Figure 4.18) compounds have "extra" living rooms because they were built by previous occupants with much larger households; population estimates for such houses might thus be inflated. In contrast, a house like 21, with but a single living room/kitchen, suggests that even if a structure has a kitchen but lacks a separate room containing a hearth it may reasonably be interpreted as a domicile. Finally, while it is suggested that dwelling rooms are useful if not flawless estimators of numbers of nuclear families, they can house from two to nine individuals, a point taken up again below.

¹³These rooms are in 1, 18, 21, 41/42, 49, 61, 62, 65/66, and 67. In some of these cases (e.g., 1), this room belongs to the family of a seasonally out-migrating male member; when he is away, his wife and children often double up with the wife and baby of his brother, who is also a migrant worker. In other cases, as in 21, 61, and 62, the residents are not married. Widowed mothers or grandmothers seem to sleep in kitchens in some houses (e.g., 67).

¹⁴For the village as a whole ($N = 63$), $r = .71$; for landed ($N = 30$), $r = .70$, and for landless ($N = 33$), $r = .66$ ($p \leq .01$).

¹⁵These "additional" living rooms are found in compounds 2, 5, 10, 13, 47, 60, 63, 64, 77/78, 79/80, and 83; most of these households are in the top two wealth quartiles. Household 64 has a resident widow (presumably accounting for the second living room) and 83 occupies a compound built by a much larger household.

As in the case of dwelling rooms, several factors militate against a simple direct correlation between the number of resident families in a compound and the number of its ovens and bins. In the case of ovens, there is a moderate positive correlation,¹⁶ despite the fact that coresiding wives tend to operate as a single food-preparing unit and hence generally to use only a single oven. It is efficient to limit cooking operations to one oven because the use of a second or third requires a doubling or trebling of fuel consumption and, as was noted above, fuel is deemed an expensive item. Thus even when a compound has more than one oven, only one tends to be used in most cooking events. As the number of consumers increases, the size of the cooking vessels, rather than the number of facilities used, increases, and the length of time devoted to food preparation may be extended somewhat.

A household may also use only one of several ovens because of problems of air circulation and smoke dispersal. Compound 1 illustrates this point: it has three coresiding nuclear families and four ovens, none of them either filled in, covered over, or modified. However, only its kitchen oven is used, because the remaining three are poorly located with respect to smoke dispersal. One of them is located in the courtyard, reflecting the village ideal of having a warm-weather oven out of doors. During the summer of 1975, when temperatures rose almost intolerably, the women of this household decided to once again use this oven (which had never been used following a few frustrating attempts immediately after its installation years before). The entire compound became smoke-filled within minutes, and it was physically impossible to continue to bake bread. On this occasion, the family began to discuss the possibility of enlarging the rather small kitchen window.

Theoretically, the number of storage bins in a compound might be related to the size of its population or to the number of coresiding nuclear families, but in reality the relationship is apparently complex. Five compounds in Aliabad completely lack bins.¹⁷ In the others, members of extended-family households pool their food resources, although bins are sometimes located in individual families' sleeping quarters (see Figure 4.12). Thus, most houses have bins and many have more than one; the total capacity of a house's storage bins should be related to the

¹⁶ $N = 57$, $r = .42$, $p \leq .01$.

¹⁷The correlation between household size and number of bins ($N = 59$) is moderate ($r = .39$, $p \leq .01$). Bins are absent in houses 7, 40, 62, 67, and 74. Of these, 40 and 67 own land. When I told several villagers of the absence of bins in some compounds, they argued that I must be mistaken; all houses, they said, must have bins, for otherwise, "Where would they store their flour?" These individuals were surprised when we returned to the five houses in question to corroborate my earlier observations. The answer to their rhetorical question is that in such compounds, flour is stored in gunnysacks; it may eventually be stored in bins currently under construction. As in the case of ovens and beehives, women make bins, primarily during the summer, when most construction is done. However, because of the demands of fuel- and wool-processing and the preparation of dried foods, the creation of a bin or oven may extend over a period of several months.

volume of food consumed by its resident household. In some cases, the sum capacity of bins in a house exceeds predictions of need based on the known household population and general Middle Eastern patterns of food consumption. Apparently such discrepancies exist because people sometimes live in houses (e.g., 83) whose bins were constructed by previous inhabitants and which, therefore, stored food for a different resident population. In addition, many people occupy houses and use bins that they built, but the household population had peaked at some point before 1975, when there were fewer residents (e.g., 15). The available data on Aliabad's bins are not conclusive, but they suggest that with an average annual per capita cereal consumption of ca. 160 kg, one would expect the storage facilities of a household of five or six to be represented by at least 1 m³ (the approximate size of many large bins, which are used to store flour and unground wheat). To phrase the point differently, we might expect to find more than one or two small bins, or more than one large bin, associated with an extended- or joint-family household.

Only three of Aliabad's 67 houses were built by the heads of small, young, nuclear-family households; in each of these cases, there is but one large bin. In a fourth case (1), in which the current household head built the house and his wife its bins, the number of bins corresponds with the number of married couples (three) and presumably closely fits the household's grain requirements. This case supports the arguments about bins and household population because the consumption requirements of this household have never exceeded those of the present (i.e., the household has never been larger or included more adults). Further, these needs are satisfied by the purchase rather than the production of cereals and legumes; in this house, bin volume would therefore appear to be closely keyed to annual consumption requirements. Bin capacity in food-producing households is probably sometimes greater than might be predicted on the basis of average annual consumption patterns, accommodating both anticipated occasional surplus productivity (allowing for the infrequent "good" year) and potential grain loss to mildew and vermin.¹⁸ Rough estimates of archaeological household population based on excavated bins at Aliabad could be checked against such independent data as number of hearths and, perhaps, metric area of dwelling rooms. Although reconstruction of archaeological bins' volumes would probably be hindered where the tops of bins were not preserved and their heights could not be accurately ascertained, rough estimates could be based on the use of a height-diameter ratio (which in Aliabad seems to result in most bins being roughly twice as tall as they are wide). This would, at the least, facilitate a preliminary differentiation among households.

The foregoing suggests that such built-in features as ovens, hearths, and perhaps to a somewhat lesser extent bins, might be of questionable value to an

¹⁸As much as 40% of stored grain may be lost in this way (Mayer 1976:17f.).

TABLE 4.2
Sizes of Architectural Areas, Allabadi^a

Architectural area	All compounds				Landed compounds				Landless compounds			
	Area (m ²)				Area (m ²)				Area (m ²)			
	N	$\bar{X}$	Median	S.D.	N	$\bar{X}$	Median	S.D.	N	$\bar{X}$	Median	S.D.
Total compound	67	252.5	194.0	199.7	33	307.4	251.0	244.6	34	199.0	160.5	130.3
Courtyard ^b	67	103.3	74.0	112.2	33	118.3	86.0	130.8	34	88.8	64.5	92.2
Kitchen ^c	74	18.0	16.0	8.8	40	19.8	17.5	10.4	34	15.9	15.5	5.7
Living room	90	22.4	21.5	7.9	50	20.9	20.0	8.1	40	24.2	24.5	7.2
Storeroom	137	21.6	19.0	13.0	79	23.9	21.0	13.9	58	18.6	17.5	11.2
Stable ^d	33	24.0	25.0	12.0	17	27.1	27.0	12.3	16	21.3	21.0	11.8

^a All figures are based on the village plan (Figure 2.1), mapped at a scale of 1:250, and include wall thickness.

^b The larger village compounds are included here and excluded in other samples.

^c Figures include kitchens used as living rooms.

^d Figures include stables used seasonally or intermittently as storerooms.

archaeologist attempting to use them in reconstructing the size of household populations in a village like Aliabad. Hearths appear to be useful diagnostic features of living rooms,¹⁹ and the number of living rooms is related to the number of resident nuclear families. Despite a moderate positive correlation between the number of ovens in a compound and the number of coresiding nuclear families, it can be argued that variation around the stated ideal (two for each compound) is sufficiently great that ovens should not be used as estimators. Further, because they are easier to cover, fill in, or use in temporary storage than they are to remove, ovens installed by earlier residents may remain undisturbed *in situ* even when no longer required by subsequent occupants. The same is true of bins, whose volume might serve as a rough estimator of the number of individual consumers in a compound, but may (at least among landed households) also reflect the anticipation of occasional bumper crops as well as the depletion of stored produce through spoilage or predation, and hence may reflect not necessarily households' average annual consumption but rather the greatest amount of produce which a household might expect to store. In any case, given some villagers' residential mobility and variation in households' needs for heating, cooking, and storage facilities throughout the domestic cycle, the maximum number of individuals or nuclear families residing in a compound during its entire history need not coincide with the numbers resident at the most recent point in that history. Regardless of the excavation strategy used, an archaeologist might be hard pressed to make this distinction on the basis of built-in features. He or she might also experience some difficulty in establishing and interpreting variations in compounds' and rooms' metric attributes. Metric data for major types of rooms are shown in Table 4.2.

In Aliabad, households owning land tend to be somewhat larger than those that are landless (see Table 3.6). Although median household size for the combined groups is 6 persons (of all ages), mean household size for the landed half of the village is 6.8, as compared with 5.7 for the landless. Household sizes are of course diminished if infants are removed from the counts, but the same contrast between landed and landless obtains.²⁰ Households owning land also have a higher percentage of extended families ($N = 18$, or 55% of landed, and 27% of all village households) than do landless households ($N = 6$, or 18% of landless,

¹⁹It was not possible for me to examine all floors in all houses. Although villagers' comments make me doubt it, some living rooms may not have hearths (and rely on braziers alone for heat). Even in such (hypothetical) cases, living rooms would probably be identifiable because of their walls and an absence of the kinds of built-in features found in other types of rooms.

²⁰If children under about 2 years of age are omitted from household counts, mean household size for the landed is 6.3 persons in contrast with 5.1 for the landless. The pattern of infant mortality discussed briefly in Chapter 2 suggests that close to one-third of the children included in the total (1975) count are likely to die before they reach 4 or 5 years of age. This, and their minimal space requirements, suggest that very small children should not necessarily be treated as equivalent to adults in archaeologists' reconstructions of households and their use of space. David (1971:117) observes that in Cameroon children are not usually considered when structures are planned and built.

and less than 10% of total village households). These contrasts suggest in turn that landed households might require, and have, more residential space than those of the landless. For the village as a whole, there is a positive correlation between household size and compound area, but this correlation is strong for the landed households and insignificant for the landless group.²¹ Data on dwelling areas (i.e., living rooms and kitchens) also reveal a difference between landed and landless households. Positive correlations between dwelling area and household size exist in both groups, but the value is substantially higher for the landed.²² The Aliabad data might be used to argue that total compound area is a useful estimator of resident population (Cook and Heizer 1968:95), but the strength of this relationship varies with economic status (and it might be impossible to distinguish between the archaeological remains of houses of the landed and landless). In theory, large compounds might simply reflect (comparatively) larger courtyards rather than more rooms inhabited by more compound residents, but there do not appear to be substantial differences in courtyards of Aliabad's landed and landless households relative to their compounds' sizes. In sum, the data suggest that for the landed (generally wealthier) households in Aliabad, there are clearer and stronger correlations not only between resident population and both overall compound area and total roofed area, but also between dwelling area and population. Despite differences in mean household size in the landed and landless groups, and contrasts in the strengths of these associations, there are positive correlations between these three categories of metric area in compounds and the size of their resident populations.

A closer examination of the Aliabad data on dwelling areas suggests that in addition to the differences between landed and landless halves of the population noted above, landed households have somewhat more dwelling space than those without land, although the differences are not great. Mean dwelling area in houses of the landed ($N = 29$) is 60.6 m², in contrast with a mean of 50.5 m² for the landless group ($N = 34$). Landed households have larger populations but also more coresiding nuclear families, each in its own dwelling room. As Table 4.2 indicates, the larger households of the landed group are accommodated by greater floor space provided by more kitchens and living rooms than are found in compounds of the landless. Thus, despite the fact that they have more dwelling

²¹For the entire village, $r = .54$ (all ages included); for the landed, $r = .79$ ($p \leq .01$). In contrast, for the landless, $r = .01$; the correlation is not statistically significant. Ajami (1969:66f.) shows that in three Iranian villages he studied, both family size and number of rooms per household increase with wealth. In Baghdad, "high-income" families have more rooms per house than "low-income" families (al-Azzawi 1969:91). Parenthetically, there is a (village-wide) strong correlation ($r = .70$, $p \leq .01$) between household size and total roofed area; again, it is stronger ($r = .84$) for landed than for landless households ($r = .24$; $p \leq .01$).

²²For the village as a whole ($N = 62$), $r = .58$ ($p \leq .01$); for the landed ($N = 29$), $r = .76$ ($p \leq .01$), in contrast with a more moderate value of $r = .40$ ($p \leq .05$) for the landless. The homes of some landed households could not be visited, and because the precise identification of dwelling rooms in their compounds was not possible, they are omitted here. In other computations, except where noted, $N = 33$ for the landed, and 34 for landless.

area, in theory there might not actually be more metric area per person in compounds of the landed because they are, on average, occupied by households that are larger, by about one person, than those of the landless. Metric values for dwelling areas may be a useful indicator of actual numbers of people.²³ If dwelling rooms like those in Aliabad could be identified archaeologically—and it is argued here that they might be—it would seem reasonable to divide the metric areas of all of them by the same estimator (such as 8, 9, or 10 m²) to develop a range of estimates of the number of people occupying such rooms.²⁴

It has been suggested thus far that the number of living rooms and kitchens reflects fairly closely the number of resident nuclear families, and that the metric area of such rooms might be used to estimate the number of family members, which ranges from 2 to 9. A sample of 61 Aliabad compounds with 334 rooms houses a total population of 354, or roughly 1 person per room (see also Watson 1978:137f.). However, people do not sleep in dung-cake storerooms or in stables, and many kitchens are also not used for eating or sleeping; such rooms can be disregarded here. Sixty Aliabad compounds with 90 measured living rooms (the few kitchens also used for sleeping are not included here) have a mean and median density of 4 persons per room. Applying this figure to a limited archaeological sample might produce a slightly lower site population estimate than would either the 8–10 m² per person estimator discussed above, or a mean figure for household size, such as 5 or 6. An archaeologist generating a range of population figures for houses might want to use all of these approaches; such figures would not, of course, correspond exactly to the number of occupants, but they might provide a range of reasonable estimates and, perhaps more important, should also reveal variations among a village's households.

An Aliabad figure of about 10 m² per person would be slightly higher than some available from other contemporary Iranian villages (8 m² in Baghestan, in the northeast; 7.3 m² in Hasanabad, nearer Kermanshah) at least in part because the Aliabad figures for room size include walling and these others do not. It is lower than some other—for example, 30 m² is given for Tell-i Nun, near Shiraz (Jacobs 1979). Cook and Heizer (1968), LeBlanc (1971), and Naroll (1962) have

²³O'Connell (1977:122) says that dwelling floor area varies "directly" with household size among the Alyawara of Australia. In a very different (and substantially more "complex") society, the immigrant Ibadites of Algeria, seven towns were built in 40 years (at around A.D. 1000), and the "size of family determined the size of house" (Etherton 1971:187). Details of economic variation among households are not included in these studies.

²⁴Given that most metric data for Aliabad's rooms and compounds are based on (measured) house exteriors and hence do not account for wall thickness, such estimators are probably slightly too high for this village. Using an average wall thickness of .5 m and the individual house plans presented in this chapter, it should be possible for interested readers to estimate actual sizes of those rooms not individually measured in 1975 by using any of several possible "correction" methods to arrive at alternative density figures. Figures measured off Figure 2.1 suggest that there may be slight differences between densities in landed and landless households. Mean density for landless households ($N = 33$) is 10.6 m² per person, with a median of 8.4 and a standard deviation of 6.8. For the landed ($N = 29$), mean density is 9.9 m², but there is a higher median figure (9.8 m²) and a narrower range ($S.D. = 4$ m²). There is a combined village-wide mean of 10.3 m² per person (median = 9.2, $S.D. = 5.7$; $N = 62$).

found that people occupy an average of about 10 m² of dwelling space in other parts of the world, but Wiessner (1974), who arrives at a comparable figure for !Kung San (Bushman) camps of 25 people, criticizes the use of a single figure in estimating site populations cross-culturally, and argues for the application of an allometric growth formula. Were an archaeologist to use a figure such as 10 m² of dwelling space per person, and assume a linear correlation between population and floor space, he or she would still have to reconstruct the total area of contemporaneous dwelling rooms at a site. If the number of residential structures could be determined or estimated, it too might be used to reconstruct the population size of an archaeological village. Such an approach would require multiplying the number of such structures by a figure (or a range of plausible figures) for average household size (Kramer 1980). The sampling problems that such methods would raise even in a site of 3 ha would be considerable; methodological and theoretical difficulties would increase with site size and organizational complexity.

ARCHITECTURAL VARIATION AND ECONOMIC STATUS

As the preceding pages indicate, there is considerable architectural variability in Aliabad. It has been suggested that some of this variability is related to differences in households' populations. Additional evidence suggests that some of the architectural diversity seen in this and other Middle Eastern villages is related to variations in households' economic statuses. Measures used to classify and rank Aliabad's households along economic lines were discussed in Chapter 3. Here I consider relationships between variations in three aspects of residential architecture (compound area, courtyard area, and room types) and differences among households in terms of economic rank.

Table 4.2 indicates that mean (and median) area of compounds is smaller among the landless portion of the population than among landed households. Within the village's landed segment, there is a very strong correlation between compound area and wealth,²⁵ suggesting that the wealthier a household, the larger its compound is likely to be. Since the remaining households in Aliabad own no land, it is possible only to evaluate the association between their compounds' areas and their wealth in *rials*; although positive, the correlation is weak and statistically insignificant.²⁶ Some of the largest houses (belonging to land owners) are among the oldest in the village, but some large (although generally younger) compounds are also occupied by landless households; while some com-

²⁵For wealth in *jufts*, $r = .87$; for wealth in *rials*, $r = .84$ ($N = 33$, $p \leq .01$).

²⁶For landless households' wealth in relation to compound area, $r = .23$ ($N = 34$, $p \leq .2$).

TABLE 4.3
Households Distributed in Wealth Quartiles and Compound Area Quartiles^a

		Compound area			
		Q1	Q2	Q3	Q4
Wealth	Q1	4, 7, 20, 57, 58, 59, 61, 62, 65/66	3a, 18, 40, 41/42	13, 21, 39	33
	Q2	5, 9, 49, 63, 71	8, 46, 68/69, 70, 73	19, 37/38, 44/45, 81	14, 16, 17, 82
	Q3	1, 43, 64, 72	2, 15, 29/30, 67, 74	6, 10, 28, 83	12, 34, 35/36
	Q4	77/78	48, 60	3, 23, 25, 26/27, 53	11, 22/24, 31/32, 47, 50-52, 54-56, 75/76, 79/80

^a Wealth quartiles:

1: 0-33,500 *rials*

2: 33,501-100,250 *rials*

3: 100,251-156,050 *rials*

4: 156,051-5,243,750 *rials*

Compound area quartiles:

1: 42-141 m²

2: 142-194 m²

3: 195-312 m²

4: 313-1358 m²

pounds have been subdivided over time, as is discussed below, there is no clear statistical association between compound area and compound age. In Table 4.3, Aliabad's households are arranged according to their economic rank (in quartiles based on *rials*) and the areas of their compounds (in quartiles). In the total sample of 67 houses, there is but one case in which a household in the top economic quartile (77/78) occupies a small compound, and only one in which a poor household (33) resides in a very large compound. Visual inspection of Table 4.3 suggests that there is a positive relationship between economic quartile and compound area quartile.²⁷

Because it is possible that variation in roofed areas and (relative) courtyard sizes is related to differences in households' wealth (as well as population), they were examined separately. On average, courtyards throughout the village take up

²⁷Chi-square = 15.5 (N = 67, df = 9, p ≤ .1).

slightly more than one-third of a compound's total area, although among the landless they tend to be slightly larger in relation to total compound area than they are in houses of the landed. Total (mean) metric area of courtyards in compounds of the landed is considerably larger than it is among the landless, even though they take up a slightly smaller proportion of overall compound area (see Table 4.2).²⁸ There is thus some evidence that roofed area increases with wealth, but the correlation is only marginally stronger for the landed than for the landless.²⁹ Because the correlations are not particularly strong, and because the differences between correlations for landed and landless households are not substantial, one might argue that total roofed area in a compound does not constitute a very useful indicator of variation in households' economic status.

In contrast, differences in sizes and numbers of rooms of various types do seem to reflect variation in households' economic positions. One might expect landed households to have more stables and storerooms in which to house livestock and store harvested plant materials. The association between household wealth (in *rials*) and number of storerooms is only marginally stronger for the landed, and both correlations are weak.³⁰ Because wealth in *rials* is partly a measure of wealth in land, one might expect a stronger correlation, since households owning land might require more and/or larger storerooms. Stables and storerooms of landed households tend to be somewhat larger than those of the landless (Table 4.2). The association between amount of land held and number of storerooms in landed households' compounds is positive, and there are also moderate associations between amount of land held and metric area of storerooms, as well as between total stable area and number of livestock owned.³¹ These findings suggest that positive associations between rank and number and area of stables and storerooms exist, but may not be clear or strong enough to argue for their use as reliable indicators or retrodictors of individual households' economic statuses.

²⁸For the village as a whole, the correlation between total compound area and courtyard area ($r = .88$; for the landed, $r = .93$, and for the landless, $r = .78$ ($p \leq .01$). These figures indicate that the larger a compound, the larger the courtyard within it. Among the landed, the courtyard takes up 36% of compound area, on average, in contrast with a mean of 41% in landless households' compounds. In the village as a whole ($N = 67$) courtyards comprise 39% of compound area (median = 36%). These figures have implications for archaeological sampling (see Chapter 6).

²⁹For the landed, $r = .53$; for the landless, $r = .49$ ($p \leq .01$).

³⁰It must be noted that the Aliabad samples of rooms of particular types are not complete: metric data could not be obtained for all rooms in some of the wealthiest households' compounds. Conceivably, if these data were available, some of the correlations discussed here might have been somewhat different. For number of storerooms and wealth in *rials*, the correlation for the landed ($N = 28$) is $r = .44$; for the landless ($N = 33$), $r = .39$ ($p \leq .05$). The figures might be somewhat higher (at least for the landed) if all storerooms, rather than only those immediately adjacent to the compounds tabulated, had been included. On the assumption that attribution of such "freestanding" rooms to particular archaeological houses would not be feasible, they were excluded from the scatterplot and product-moment correlation calculation.

³¹For the landed, the correlation between landholdings and number of storerooms is $r = .53$; between amount of land held and area of storerooms, $r = .45$ ($N = 32$; $p \leq .01$). Among landowning households, the correlation between stables (metric area) and livestock (all types) is $r = .46$ ($N = 24$, $p \leq .05$). Across the entire village ($N = 52$), stable area correlates with both livestock holdings ($r = .52$, $p \leq .01$) and with wealth in *rials* ($r = .52$, $p \leq .01$).

There are also differences in dwelling rooms of Aliabad's landed and landless households. An inspection of data for living rooms and kitchens suggests that kitchens of the landed are generally somewhat larger than those of the landless; variance in their areas is, however, somewhat greater than it is in landless households' kitchens. Individual kitchens appear to be larger in compounds of the landed because they are, on average, about 1 m longer; this variation in room length may reflect a marginally greater financial investment in roof beams on the part of landed households. In the case of living rooms, too, variations in metric area result from differences in room length rather than width; all houses appear to be built with beams of fairly standard length, 3.5–4 m (see also Hall *et al.* 1973:257). Living rooms in houses of the landless are somewhat larger than those in landed households' compounds. This may reflect an expectation on the part of the landed that it will be financially feasible for them to add more living rooms as they are needed; as was noted above, a number of compounds of the landed have both more kitchens and more living rooms than those of the landless. I cannot offer a satisfactory explanation for the number of "extra" kitchens in landed households' compounds. Some of them have clearly not been used for some time except to serve such secondary functions as storage, or housing for poultry. Additional living rooms can in both cases be explained by the fact that most are used to house separate nuclear families in extended-family households.

When Aliabad's households are grouped into quartiles based on wealth, median density in dwelling rooms drops, and variance is less, with increasingly high economic rank (Table 4.4). In general, the wealthier a household is, the more dwelling area its compound is likely to have. There is a positive association between economic rank (measured in *rials*) and dwelling area (all of a compound's living rooms and kitchens), but in landed households' compounds the correlation between these variables is fairly strong; it is weaker for the landless.³² The fact that stronger correlations generally obtain among the landed sample may reflect greater variability in the economic positions of the landless households at those periods when they were able to purchase house lots. Some households (e.g., 1) had accumulated some capital by 1975 and were comparatively wealthier than they were when they first defined their residential boundaries. Other households (e.g., 33) were members of older, more "established" tenant families, and yet others (e.g., 13, 34) occupied large, new compounds that may have been financed by wealthier landowning inlaws.

.01). The number of stables in a compound does not seem to be a reliable measure of the presence of particular species (which would be of some interest, since cattle and donkeys are associated with ownership of fields). Of the 35 compounds with only one stable, 26 (74%) have both small and large animal species. These are, conceivably, sometimes segregated by using pens and *zir-e zamins*, or by doubling up livestock in the stables of kin; the Aliabad data do not permit a detailed evaluation of this possibility.

³²For the village as a whole ($N = 62$), $r = .64$ ($p \leq .01$); for the landed ($N = 29$), $r = .73$ ($p \leq .01$), and for the landless, $r = .37$ ($p \leq .05$).

TABLE 4.4
Economic Rank and Density in Aliabad Dwelling Rooms^a

	Wealth quartile			
	1	2	3	4
Number of households	16	17	16	13
Density (people per room)				
Mean	10.6	9.4	10.9	10.4
Median	7.8	8.2	10.6	10.7
S.D.	9.0	4.0	4.7	2.0

^a Figures for household populations used to compute density include all members.

Observations in Aliabad and other villages in the Kangavar area suggest that relatively greater wealth is not associated with greater differentiation of rooms or other activity areas. In North America, people make capital investments in their domiciles, "improving" them either in terms of construction materials and furnishings, or by adding not only more bedrooms or bathrooms, but also functionally different rooms (e.g., "playrooms," "dens," "studies"), or both (Hall 1966:103f.). In Aliabad, relatively greater wealth seems to be associated with the addition of more rooms of the same types, such as a second living room or kitchen. Partial exceptions to this pattern are old storerooms (50–52, 79/80) that have been converted to garages.³³ Greater wealth also appears to be reflected in comparatively larger compound area and, somewhat less clearly, in roofed areas, some of which (such as stables and storerooms) are directly related to the sources of that wealth (land and livestock). Perhaps in a less patterned and more subtle and idiosyncratic way it is also reflected in building materials and structural ornamentation.

In contrast to metric areas and numbers of particular room types, there are no apparent associations between wealth and such features as ovens and hearths. (One might make the rather tenuous assumption that the existence of multiple contemporaneous hearths in a compound reflects coresidence of several nuclear families [Watson 1978:156] and that these, in turn, tend to occur more often in comparatively wealthier households.) Troughs indicate that a room functions as a stable, but these are found in houses at all economic levels. Bins, too, would appear to be only minimally indicative of variations in the economic status of Aliabad's households. It has been suggested here that bins serve the useful means

³³I am grateful to Susan Philips of the University of Arizona for discussing this with me. In a broad sense, of course, rooms of additional types are added to houses of comparatively wealthier Aliabadis, since those owning neither land nor livestock do not require stables or fodder storerooms. However, some rooms of these types are found in compounds of such households. The Aliabad garages are partial exceptions in that they are recycled rooms rather than newly built additions designed to serve as vehicle storerooms from the outset.

of identifying the functions of rooms in which they are found (most often, kitchens), and also that they might be useful in developing estimates of household population size. All families must eat, however, and it was noted that households without land purchase or otherwise obtain storable plant foods, which are kept in bins within their compounds. Among Aliabad's landed group there is only a very slight positive correlation between a household's landholdings and the number of bins in its compound.³⁴

Ovens, hearths, troughs, and bins are built by household members. In contrast, wells and latrines are generally dug by specialists. The fact that they are differentially distributed throughout the village (see Table 4.1) suggests the possibility that they reflect economic variation among households. All but one (65/66) of Aliabad's wells are located within compounds; some of the latrines used by villagers are situated in more publicly accessible locations, which allow them to be shared by several households. However, there are no apparent associations between a household's economic rank and the presence or absence in its compound of a well or a latrine. Many low-ranking households ($N = 15$) have latrines, and several in high economic quartiles ($N = 8$) do not, using communal alley toilets or gardens. Thus although they are not uniformly distributed throughout the village, and may require cash payment to specialists who dig them, wells and latrines are neither clearly nor significantly related to variations in households' economic statuses. There are no data to support an alternative explanation, that they occur in houses whose occupants are more widely traveled and/or better educated. (That this is a possibility is suggested by the presence in 1 of a shower as well as a latrine. Although their technologically unsophisticated shower appears to be viewed, by household members, as something of a status marker, it also reflects their concern with matters of hygiene and health, manifested in numerous conversations. A second possible cause of differential distribution of wells and latrines might be variation in location of soils suited to deep excavation and drainage.)

In concluding this discussion of relationships between architectural and economic variation, the distribution of two-story dwellings merits brief consideration. Two-story houses interest archaeologists for several reasons, including their possible role in the estimation of archaeological population size. If one could determine on stratigraphic grounds that an excavated structure had had two or more stories, for example, it might be legitimate to assume that its household population had been larger than those in contemporaneous single-story dwellings. Because they use more building materials, two-story houses might also be related to economic variations within a settlement. They might thus imply larger and/or wealthier households in archaeological contexts.

³⁴Here $r = .16$ ($N = 27$, $p \leq .1$). The correlation might have been somewhat stronger had it been feasible to collect data on bins from all of Aliabad's landed households. The distribution of bins and the other built-in features discussed here is shown in Figure 2.1.

At Seh Gabi, an excavated prehistoric village in the Aliabad area, the existence of a multistoried structure was inferred primarily from a series of superimposed surfaces in combination with beam holes in standing walls. Cruciform hearths with some formal similarities to hearths in Aliabad were found on Seh Gabi's superimposed floors. The preservation at this site is somewhat unusual: wall stubs were preserved to heights that in some places exceeded 2 m. Archaeological preservation of comparable quality cannot always be expected. When it does not exist, such structural elements as stairways and variations in wall thickness might reflect the existence of a second story. In Aliabad, when a structure has two stories, its ground-floor walls are, ideally, 1 m thick or more. If an originally unanticipated second story is added to a house, the thin ground-floor wall (of about 50–60 cm in width) is reinforced with an abutting second wall, which provides the thickness and strength required to support the second-story superstructure (see Figure 4.7).³⁵ Commonly associated with a second story is a stairway of plastered sun-dried bricks either in an enclosed stairwell or out of doors, running up the courtyard side of a downstairs wall to the second story. The distribution of two-story houses and the location of such stairways are shown in Figure 2.1. On structural and stratigraphic grounds, the archaeological remains of Aliabad's one- and two-story houses should be distinguishable in most if not all cases.

One might expect households in multiple- rather than single-story dwellings to be larger, but the Aliabad data suggest that this is not necessarily the case. There, second-story rooms are almost always living rooms (those used for light storage, as in 1, sometimes double as guests' sleeping quarters). When a second story is built, the total number of living rooms in a house is not necessarily increased, since ground-floor dwelling rooms are often modified to take on other functions (83, shown in Figure 4.18 and described below, is unusual in this respect). Although a second story might as much as double a house's total floor area (although in Aliabad none do), it does not necessarily shelter a doubled resident population; rather, it redistributes the original inhabitants. There is no association between the number of resident nuclear families and the existence of a second story.³⁶ It is therefore suggested that whether one is concerned with

³⁵Villagers say that if a second-story room is planned during the initial stages of a house's construction, the foundation trench will be wider and deeper than that for the walls of a one-story room; it will be up to 2 m deep, two to three times the depth and width of a trench for a one-story room.

³⁶Chi-square = .35 ($df = 1$, $N = 67$, $p \leq .6$). The absence of an association between second stories and the presence of more than one nuclear family is also reflected in the results of a Yule's Q transformation of odds ratios. This method for dichotomizing data, converting them into odds ratios and then into the Q measure, is discussed by Davis (1974) and Goodman (1965). I am indebted to William Mason of the University of Michigan for introducing me to this statistic, and for helping me to analyze this portion of the Aliabad material; he is in no way responsible for any flaws in the following presentation. In the procedure followed here, the three conceptual dimensions wealth, second story, and nuclear families were treated as variables and dichotomized in order to examine relationships among economic rank, number of coresident families, and two-story dwellings. For wealth, household position above or below the village median (in *rials*) was used as the basis for dichotomizing the sample. Because households

establishing the number of inhabitants or the number of coresiding nuclear families, the actual location of the dwelling rooms within structures is irrelevant. In Aliabad, second stories appear to have no relationship to either, and might not be as useful in reconstructing demographic parameters (of this settlement) as would number and metric area of dwelling rooms.³⁷

It is possible that in towns, where real estate is more costly (Berry *et al.* 1963), livestock fewer than in rural settlements, and food purchased in bazaars, the need

either reside in a two-story dwelling or do not, this variable is inherently dichotomous. Nuclear families was transformed into a dichotomous variable by coding households as having either one nuclear family (including those consisting of widows with unmarried children) or more than one nuclear family (including widows residing with their married offspring and grandchildren). The formula for Yule's Q is $(ad - bc)/(ad + bc)$, with Q ranging from +1.0 to -1.0. The values obtained for a two-by-two contingency table in which a third variable is controlled are termed conditional; their combined partial Q value reflects the interaction of these variables in relation to the third (the partial is an average of the two conditionals). Yule's Q is not a measure of statistically significant interaction; it serves to point up the relative extent of interaction between two variables when a third is held constant (present or absent), and to indicate whether the interaction is positive or negative. Thus in examining the interaction among wealth (A), presence/absence of second stories (B), and presence/absence of extended families (C), when we control for wealth there is little or no relationship between number of nuclear families and two-story structures (see the two sets of cells on the left). In contrast, when we control for the number of nuclear families, there is a slight positive association between wealth and the presence of second story (see the two sets of cells on the right).

A+		A-		C+		C-		
B+	B-	B+	B-	A+	A-	A+	A-	
C+	10	7	C+	3	5	B+	10	9
C-	10	7	C-	9	16	B-	7	16
(Q = 0)		(Q = .032)		(Q = .41)		(Q = .43)		
Partial Q = .01				Partial Q = .43				

³⁷Several of Aliabad's nuclear-family households occupy compounds whose only living rooms are located on the second floor. On logical grounds one might argue that where—archaeologically—both a ground-floor living room and a second-story room could be shown to have been in use at the same time, there had been more than one nuclear family in residence. However, the possibility of stratigraphically demonstrating such contemporaneity seems distinctly limited, given the nature of collapsed architectural debris in many Southwest Asian sites. One would have to argue from negative evidence: since all houses are, initially, one-story structures, the living room (of, let us say, a nuclear family occupying the compound alone) would be on the ground floor in the early stages of the compound's history. When a second-story room is built, if the ground-floor living room was not to be used by that same couple, or by another couple (e.g., a newly married son and his family), the living room would probably be functionally and morphologically altered. Its hearth might be deepened to accommodate an oven, converting the living room into a kitchen; it might be deepened to make a barley pit; or it might be filled in and the room converted to a stable or storeroom. Stratigraphic evidence of such structural and functional modification should indicate that a former living room was no longer being used in the same ways, and would suggest that the number of nuclear families should not be doubled in one's reconstruction of the archaeological population. The argument is supported by the fact that in Aliabad there is only one compound (83; see Figure 4.18) in which both ground-floor and second-story living rooms are currently used by a single nuclear family. It is worth noting that this house was purchased from the builders and former occupants (a nuclear-family household with 11 members); the number and functional distribution of rooms reflect neither the composition nor the history of the household that now inhabits it.

for stables and storerooms is limited and ground-floor rooms in multistory dwellings are most often domiciles. If this could be empirically demonstrated, it might in turn suggest that population estimates for archaeological "towns" should perhaps be somewhat higher than those made for "villages" (which would have lower household densities), and that awareness of this (possible) distinction would be particularly desirable when such estimates are based exclusively on site sizes recorded during surface surveys. Additional ethnographic and ethnohistoric data from Southwest Asia and elsewhere are badly needed to clarify the content and range of differences among settlements of varying functional size (Fathy 1969/1973:91ff.).

Thirty-two of Aliabad's 67 houses have second-story rooms. These houses are not necessarily inhabited by comparatively larger households, and it is conceivable that they do not reflect relatively higher economic status either. The addition to a house of a second-story room need not represent a major investment, since the beams of the underlying ground-floor room are generally removed and replaced by a vaulted ceiling of mud brick, and may be reused in roofing the new second-story room. Of the 32 two-story houses, 15 (47%) belong to landowners. A slight majority of the two-story dwellings in Aliabad thus belong to landless households. Nonetheless, in controlling for number of coresiding families, there appears to be a moderate positive association between wealth and ownership of a two-story house. It was noted above that wealth is positively correlated with comparatively large compound area. The fact that the largest landowner and wealthiest household in the village occupy the largest compound (79/80), a one-story house, suggests that the presence of a second-story room or rooms in a dwelling might be more closely related to crowding and a concomitant inability to fill in (small) compounds on the ground-floor level than to either wealth or household size.³⁸ It might be argued that perhaps the presence of a second-story room is positively correlated with small compound size; since a compound's area is "fixed" by its perimeter wall, households with greater or increased room requirements might tend to move upward, by building a second story, since they cannot necessarily move horizontally by extending their compound perimeters, and they would probably want to avoid encroaching too extensively on valued unroofed courtyard space. On the other hand, those households with the largest compounds need not expand vertically, since they have the spatial option of expanding on ground-floor level.³⁹

³⁸This notion receives some slight support in the product-moment correlations between courtyard area and presence/absence of a second story. For the entire village, the correlation is $r = -.09$; for the landed group, $r = -.12$; and for the landless, $r = -.04$. For total compound area, the correlations are not all negative. For the entire village, as compound area increases, so does the tendency to have a second story ($r = .03$), and there is a very slight positive correlation for the landed ($r = .09$). For the landless, as compound area increases, the likelihood of having a second story apparently decreases ($r = -.04$). None of these correlations is statistically significant.

³⁹This possibility was evaluated by dichotomizing the three variables involved and computing the Yule value (Q) of the odds ratios obtained from contingency tables. As previously (see note 36), the wealth variable (here B) was

The Aliabad data suggest that when one controls for compound area, wealthier households are more likely than poorer ones to have two-story houses. Although there is a positive association between the presence of a second story and large compound area, it is substantially stronger for those with larger compounds. When one controls for wealth, a disparity between the wealthier and poorer households emerges. It would appear that poorer households (i.e., those with less than median village wealth, expressed in *rials*) are more likely to have a second story when they have (relatively) small compounds. In contrast, among the wealthier village households, those with larger compounds are more likely to build upward than to in-fill on ground-floor level. This apparent "pattern" may reflect a cultural value which eludes a strictly "functional" explanation in that the construction of a second-story room or rooms may, for many of those able to afford it, be a mark of status rather than simply a reflection of spatial constraints.

In this connection, it is interesting that two landless household heads, asked on the first day of my 1975 fieldwork how many of Aliabad's houses had two stories, responded "All." This reply, unrelated though it may be to objective reality, nonetheless accurately reflects a cultural ideal. As DePlanhol (1968) and others have noted, a second-story room is considered desirable in hot months; in Aliabad, the behavior of only one household (83; see note 37) actually corresponds to the widespread ideal of occupying a second-story living room during the summer and a ground-floor room in winter. For the archaeologist, who may be able to identify and distinguish one- from two-story dwellings, it might be most productive to establish on other grounds (e.g., metric area of compound, number of dwelling rooms, stables, and storerooms, building materials) whether a house should be classified as comparatively wealthy or poor. Assuming a reasonable sample, the presence or absence of a second story might then be used in conjunction with these other criteria in classifying a particular house as relatively wealthy or poor; in itself, the presence of a second story is potentially misleading, since under certain conditions (most notably, when constrained by

dichotomized at the village median, and the presence/absence of a second story (here A) is inherently dichotomous. Compound area (C) was treated like wealth, with median compound area for the village as a whole taken as the boundary above or below which households were coded as either present or absent. The pairs of cells shown on the left control for compound area; those to the right control for wealth.

C+		C-		B+		B-									
A+	A-	A+	A-	A+	A-	A+	A-								
B+	13	8	B+	7	6	C+	13	8	C+	3	12				
B-	3	10	B-	9	11	C-	7	6	C-	7	11				
(Q = .688)				(Q = .176)				(Q = .164)				(Q = -.436)			
Partial Q = .45								Partial Q = -.12							

limited compound area), poorer households may be more likely than wealthier ones to construct a second story.⁴⁰

HOUSING ELSEWHERE: EXAMPLES

Some of the patterns observed in the Aliabad architectural data appear to exist in other small-scale rural settlements in Southwest Asia, although there are comparatively few systematic descriptions of vernacular architecture and settlements' spatial organization (but cf. Horne 1981). The association of larger houses and of two-story houses with relative wealth has been described for some other settlements. In Yassihoyuk, for example, there are reportedly rather marked differences between houses of the lowest and highest income groups. Photographs illustrating "typical" houses for each of the village's four income groups (see Table 3.1) clearly show that roofing materials, number and type of windows, surfaces of walls, and number of balconies and stories vary among these groups (METU 1965:17ff.). Those of the poorest families are one-story houses with few rooms; they are also very poorly furnished. In contrast, the wealthiest villagers have many more rooms, and often live in two-story structures (METU 1965:40ff.; 101). There is one three-story house in Yassihoyuk; it was the most expensive to build, and although it contains the same features as two-story houses, it has more rooms and more living space (METU 1965:114). (Aliabad has no three-story houses. It was reported that the only three-story house in the area was in a village at some distance and was owned by the family of the former headman of that village.) Unfortunately, metric data for Yassihoyuk's buildings are not available, the number and distribution of two-story houses are not indicated, and it is not clear whether the three-story dwelling is occupied by a larger household. As in Yassihoyuk, there appears to be an association between wealth and architectural variation in Alisar, another village on the Anatolian plateau, where one of the largest landowners occupies one of the village's largest compounds. In contrast, the smallest residence ("a hovel so mean as hardly to be

⁴⁰With characteristic generosity and at his own initiative, Bill Mason conducted a computer-facilitated loglinear analysis of the Aliabad data on wealth, nuclear families, compound area, and second stories. This form of analysis allows for testing the significance of possible forms of interaction among the data, by transforming observed Q values (see notes 36 and 39) to expected values, which may then be tested by using the chi-square distribution. The fact that an additive model that Mason used in his analysis fits the data well suggests to him (personal communication) that the hypothesis of significant interaction between wealth, compound area, and presence/absence of a second story should be rejected. It must be noted, however, that the Aliabad sample is small ($N = 67$), and that ethnographic observation suggests that two-story dwellings are not actually randomly distributed. For these reasons, I am inclined, along with Mason, to emphasize the apparent interaction suggested by visual inspection of the odds ratios, and to maintain not as a statistically demonstrated association but rather as a working hypothesis that the presence or absence of a second story is related to the wealth of compound residents. Though it may be suggestive, therefore, the foregoing discussion is best considered speculative rather than conclusive.

dignified with the word complex") is occupied by a landless widow (Morrison 1939:78).

One of the ways in which Anatolian houses appear to differ from those of Aliabad is the frequency with which their surfaces are plastered and whitewashed. In Yassihoyuk, buildings' interiors are reportedly whitewashed six to eight times each year, and exteriors are resurfaced once or twice a year (METU 1965:111). A high frequency of whitewashing is also reported for Asvan (Weinstein 1973:274f.). In these Turkish settlements, straw is added to both whitewash and mud plaster, suggesting that frequency of plastering may be a function of household wealth (poorer households with less chaff from smaller landholdings may plaster less frequently).⁴¹ In Asvan, two-story dwellings usually (but not invariably) reflect the relatively greater wealth of households occupying them (Hall *et al.* 1973:247). The accounts of both Asvan and Yassihoyuk indicate that the cost of house construction can be quite variable (Hall *et al.* 1973; METU 1965).

In Syria, Sweet has noted considerable architectural diversity (in Tell Toqaan) and reports that it reflects variation in households' economic statuses (1960:110ff.). Toqaan's architecture is in many respects similar to that of Aliabad; notable differences are the frequent occurrence in Toqaan of domed roofs and the rarity of two-story houses. The single two-story dwelling in Toqaan is, however, owned by an urban landlord.⁴² Sweet also notes that straw is "money" (1960:71); frequent plastering here may be a function of (comparative) wealth. Sweet does not provide metric data for Toqaan's compounds, or plans for individual structures, but her description of the variety of houses and building materials clearly indicates that the smallest, most flimsy structures are owned by families "of low economic status" (1960:113). In another village in the Aleppo area, the largest compound, described as otherwise resembling the village's other houses, is occupied by a very wealthy individual (Sweet 1960:115).

A rough association between size and form of dwelling and type of resident household is reported by Antoun (1972:58). In Kufr al-Ma, Jordan, a one-room house is generally inhabited by a nuclear family, a three-room house by an extended family, and a house of five or six rooms is often occupied by a polygynous family. However, relationships between various types of households and varying residential structures appear to have broken down over the years. Antoun attributes this to increasing differentiation in occupational structure, changes in family organization, and a decrease in the number of families acting as produc-

⁴¹A slight discrepancy between two accounts of plastering in Asvan should be noted (compare Weinstein 1973:274f. with Hall *et al.* 1973:259).

⁴²The second-story room here was reached by an exterior wooden stairway. It is not clear from Sweet's account whether the walls supporting this room were wider than they were elsewhere in this or other compounds, and it is therefore unclear whether the presence of a second story might be inferred from the archaeological remains of such a structure.

tive units. He also mentions that there have been changes in houses' formal attributes, but does not discuss them in any detail.

Finally, observations on urban architecture made by Alten (for Sanandaj, the capital of Iranian Kurdistan) and by Bonine and Boyce (for Yazd, on the eastern edge of the Iranian Zagros) may be mentioned. Alten does not provide an abundance of descriptive detail, or any metric data, on Sanandaj's architecture. However, he does report that although most are small, this Zagros town's houses are often two or three stories high; there are also a few "medium-sized" houses and some "grand mansions." The rich "clans" have palatial homes, sometimes owned and occupied by a number of individual households (Alten 1959:8f.). Alten also noted variations in building materials, with homes of the wealthier citizens having an external facing of imported brick, in contrast to more ordinary domiciles which, like those of Zagros villages, tend to have exterior surfacings of mud plaster and interior gypsum plaster (1959:9). In their rather different studies, which include detailed ground plans for a tiny sample of urban houses, Bonine and Boyce indicate that diversity in domestic architecture in the large urban center of Yazd can reflect both "ethnic" differences (between Muslims and Zoroastrians) and economic variation (between poorer and wealthier Muslim households; see Bonine 1980; Boyce 1971:125f.). Such variations are reflected in both architectural layout and building materials. "Ethnic" diversity may be greater in relatively larger centers, but it has also been reported by Sweet for the small village of Tell Toqaan. There, however, variation in domestic architecture is attributed both to variation in economic rank and to primary subsistence orientation ("peasants" versus pastoralists) rather than to ethnic variation (Sweet 1960). Perhaps vernacular residential architecture reflects differences in the economic rank of households regardless of variations in ethnicity or settlement function.

RESIDENTIAL ARCHITECTURE, SPATIAL DISTRIBUTION OF KIN, AND CHRONOLOGY

Although it is small, the ethnographic sample just reviewed presents something of a challenge to those arguing that variation in compound size can be readily shown to vary with postmarital residence pattern (Divale 1977; Ember 1973), if only because they have ignored the role that such factors as economic and ethnic variation, and differences in households' sizes, may play in architectural diversity within settlements (Hill 1968). This is not to deny the importance of residence "rules" or preferences, which although variable within individual sociocultural systems, clearly exist (Goodenough 1956).

Close proximity of near kin is reported for societies that are organizationally quite diverse. For example, among the !Kung of Botswana, nuclear families

occupy individual huts around the camp circle; the huts of members of extended families tend to be contiguous (Yellen 1977:89). Similar patterns are reported for mobile groups in other parts of the world. When Cheyenne hunters camp, the tents of macroband comembers are pitched next to one another (Fraser 1968:21), and among Shammar and other Bedouin pastoralists, temporary camps consist of clusters of tents ordered in kin units (Sweet 1969:168f.). Among sedentary Mailu horticulturists in Melanesia, extended-family households occupy adjacent houses, each clan occupying its own part of the village (Fraser 1968:28). Among the agricultural Bankalawa and Jarawa of the Jos plateau of Nigeria, lineage members of the same patriline live near one another in compound clusters (Conant 1962:553) and, in rural India, members of the same occupational and kin groups tend to be localized within villages (Fonseca 1969:106f.).

In Aliabad, women tend to reside with their spouses' families, and daughters marry out of the village more often than do sons. Sons and wives settle with, or as close as possible to, close patrilineal kin; spatial arrangements in the village during 1975 indicate that sons most often live with fathers, but that some also reside with married brothers or married uncles. The preference for patrilineal parallel cousin marriage, and the fairly high incidence of other forms of endogamous marital alliance, can produce situations in which a single household includes a couple, their unmarried offspring, a married son or daughter (or both), and the niece or nephew to whom they are married (Figure 2.2).

There are only two households without kin elsewhere in Aliabad (21, 64). The widow in 21, already cited as the acknowledged village charity case, was given her house, and is provided with fuel and food by various friends and neighbors. Although without kin in the village, 64 has become an extended virilocal household. An additional nine houses are occupied by households whose heads have only affinal kin in other village compounds;⁴³ most of these household heads were immigrants. All of the other houses in Aliabad are occupied by people with various categories of kin in one or several other village houses; Table 4.5 indicates only the single closest kin/residential pairs for each household.

Of the village's 67 houses, 38 (57%) involve coresidence or near-neighborliness of parents, sons, and brothers. Such pairs of kin are either in the same compound, in adjacent compounds, or in compounds opposite one another across a narrow alley. In at least one case, the adjacent houses of two brothers (58, 59) are separated by a courtyard wall in which there is a window. Of these 38 houses, 20, or almost one-third of Aliabad's houses, are occupied by extended virilocal households. The tendency for near patrilineal kin to reside in close proximity has been noted elsewhere in Southwest Asia, and in parts of Africa. For example, Schwerdtfeger (1971:71) reports that among some Nigerian

⁴³These are 4, 13, 23, 29/30, 34, 37, 40, 41/42, and 44/45. Heads of households 23 and 34 were born in Aliabad.

TABLE 4.5
Spatial Distribution of Patrilineal Kin^a

Kin relations	Spatial distance						No kin
	Same house	Adjacent houses	Facing across alley	Same block	Neighboring blocks	More distant blocks	
Parents and married sons	1, 3, 11, 17, 23, 26/27, 29/30, 31/32, 35/36, 37/38, 41/42, 44/45, 48, 49, 54-56, 64, 65/66, 67, 68/69, 77/78	25(26), 20 + 33, 60 + 61	3a(3)				
Married brothers	22/24, 50-52, 75/76, 79/80	53(50), 58 + 59, 57(54), 47 + 15, 12(11)	9(18)	8 + 10, 14 + 19, 28(22/24)	82(48)		
Uncles and married nephews	18(36)	72 + 73, 46(15), 16(17)		7(11), 62(22/24)		40(60), 43(18)	
Male cousins				71 + 74, 39(35)			
Parents and married daughters			81(77)		70(63), 34(76)	13(23)	
Uncles and married nieces							
Sisters; sisters and brothers			63(67, 81), 83(61)		6(17), 5(11)	2(59), 4(70)	
No kin							21
Totals	25	16	5	10	5	5	1

^a Sample size is 67. Numbers (except totals) refer to households (see note 3, Chapter 2). Each compound is listed only once, in the cell in which nearest kin are in closest proximity; other spatial relationships are not indicated here (see Figures 2.1 and 2.2). Parentheses indicate that the enclosed household has been shown in another cell as part of a closer kin/spatial pair.

Hausa, full brothers are less likely than half-brothers or parallel cousins to make residential shifts involving spatial separation, and in Yoruba towns, single-entrance compounds house localized lineages (Fraser 1968:43). Leach (1940:48) notes that in Iraqi Kurdistan close kin live in the same block of houses, and Alberts (1963:172, 524ff.) observed a similar pattern in Davarabad, as did Sunderland (1968:630) in Tezerjan (also on the Iranian plateau); Stirling (1965:26), Sweet (1960:55), Antoun (1972:73), and Gulick (1955:111) document the same preference in villages in Turkey, Syria, Jordan, and Lebanon, as does Grandmaison (1980) in Oman. This locational objective can be achieved and maintained in a variety of ways, including the construction of new buildings on adjacent empty house lots, the subdivision of preexisting compounds, and house purchase from or exchange with nonkin or more distant kin in order to move closer to near(er) kin. Examples of all of these strategies can be found in Aliabad.

A number of influential publications have addressed the question of how archaeological data may be used to infer principles underlying prehistoric residential patterns. In the American Southwest, where a long and substantial ethnohistoric record is available to archaeologists, they are apparently fairly safe in assuming a pattern of matrilocal postmarital residence in the late (i.e., recent) prehistoric period (Hill 1970b; Longacre 1970a). Several attempts to identify organizational principles have focused on decorated ceramics; predicated on the assumption that prehistoric potters were women, these studies rely heavily on ethnographic analogy (e.g., Deetz 1965; Hill 1970b; Longacre 1970a; Whallon 1968; see Allen and Richardson [1971], Dumond [1977], and Plog [1980] for critiques). In at least parts of Southwest Asia, where a preference for virilocal residence and an emphasis on patrilineal descent principles appear to extend well into the pre-Islamic period (Kramer [n.d.]; Stone 1981), the problem of identifying such principles in the absence of epigraphic data remains. In Aliabad, which lacks any class of imperishable, locally manufactured object comparable to the decorated pottery of the American Southwest, the possibility of future archaeologists' plausibly inferring residential patterns on the basis of portable items would appear to be virtually nil. However, architectural details, in particular structural relationships between adjacent compounds, might suggest the existence of relationships between their inhabitants (see Figure 4.19). Another approach, too problematical to be treated satisfactorily here, would be to address the broader question of the possibility of identifying principles that might allow us to specify circumstances under which societies are likely to be organized along particular lines (Ember 1973; Pasternak *et al.* 1976; Reyna 1976). In any case, archaeologists investigating prehistoric principles of residence (or descent) should specify why these are important or engaging issues. Presumably, at least one reason for archaeologists' interest in the organization of localized social groups is their assumption that group composition and principles of social organization are

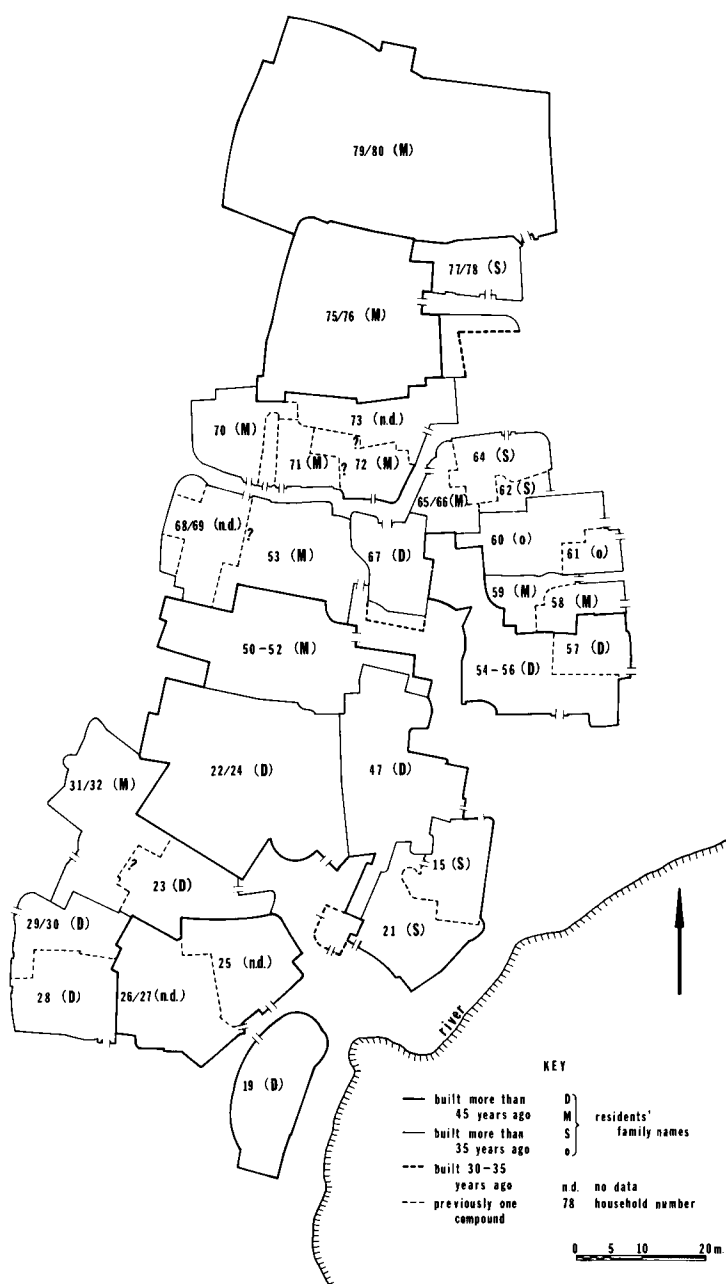


Figure 4.19. Aliabad, circa 1940 A.D. (reconstructed in 1975). Family names refer to occupants at that time.

often related to other aspects of sociocultural behavior whose spatiotemporal distributions and evolution they investigate.

A discussion of spatial relationships of kin in Aliabad cannot be divorced from a consideration of the relative chronology of the village's houses. This issue has implications both for archaeological approaches to stratigraphic relationships among houses and for improving our understanding of the material correlates of changes in settlement configuration and population density.

Aliabad is probably at least 100 years old, and it is fairly clear from informants' accounts that some of its houses were built more than 50 years ago. Although it is sometimes maintained that rural houses in Southwest Asia tend to be shorter lived, as in some areas they doubtless are (Voigt 1976:78), this need not always be the case. In Yazd, for example, some houses built with traditional materials and layout have been standing for more than 150 years (Boyce 1971:126), and in arid zones in general, house longevity would appear to be partly a function of conscientious maintenance. It was not possible to establish tight chronological control in Aliabad, partly because of native modes of measuring time and partly because many villagers have not lived there for more than the past 30 or 40 years. Nonetheless, a rough but reliable chronology of the village's structures could be reconstructed for the past 50 years (Figures 4.19 and 4.20).

Two general points may be made regarding Aliabad's architectural chronology. First, the village's most recent immigrants tend to view themselves as living in peripheral areas. For example, one informant (2) described his former residence as having been "in the village"; he referred to the northern half, where the oldest compounds are located. (Sweet's account [1960:54] implies a similar ethnotaxonomy for areas within Tell Toqaan.) In Aliabad, most of the families whose names (o) differ from the three that predominate (see Figure 2.2) live in a single block of houses (1-5) not included in the area referred to by the informant in 2 just mentioned. Second, the oldest houses in the village are those that are occupied by descendants of the former headman (D) and another important individual (M). These houses are at least 50 years old (Figure 4.19). Although it was not possible to make a contour map of Aliabad to demonstrate the point, this portion of the village is also somewhat higher than other areas, and has more incipient mounding (see Figure 4.9). It also has a number of "ramps" leading to roofs; these are probably the decayed remains of old rooms, and they are absent in the southern half of the village. Households with the family names D and M, which account for the bulk of Aliabad's landowners, predominate in the northern half of the village, with M houses dominating the northernmost portion (Figure 4.20). A somewhat more recent group of houses is occupied by those bearing the third most common family name (S; these households also constitute the third major group of landowners). These compounds are somewhat smaller than some of those which antedate them, and some of them were "tacked on" to preexisting blocks (e.g., 48, 49). The precise configuration of individual com-

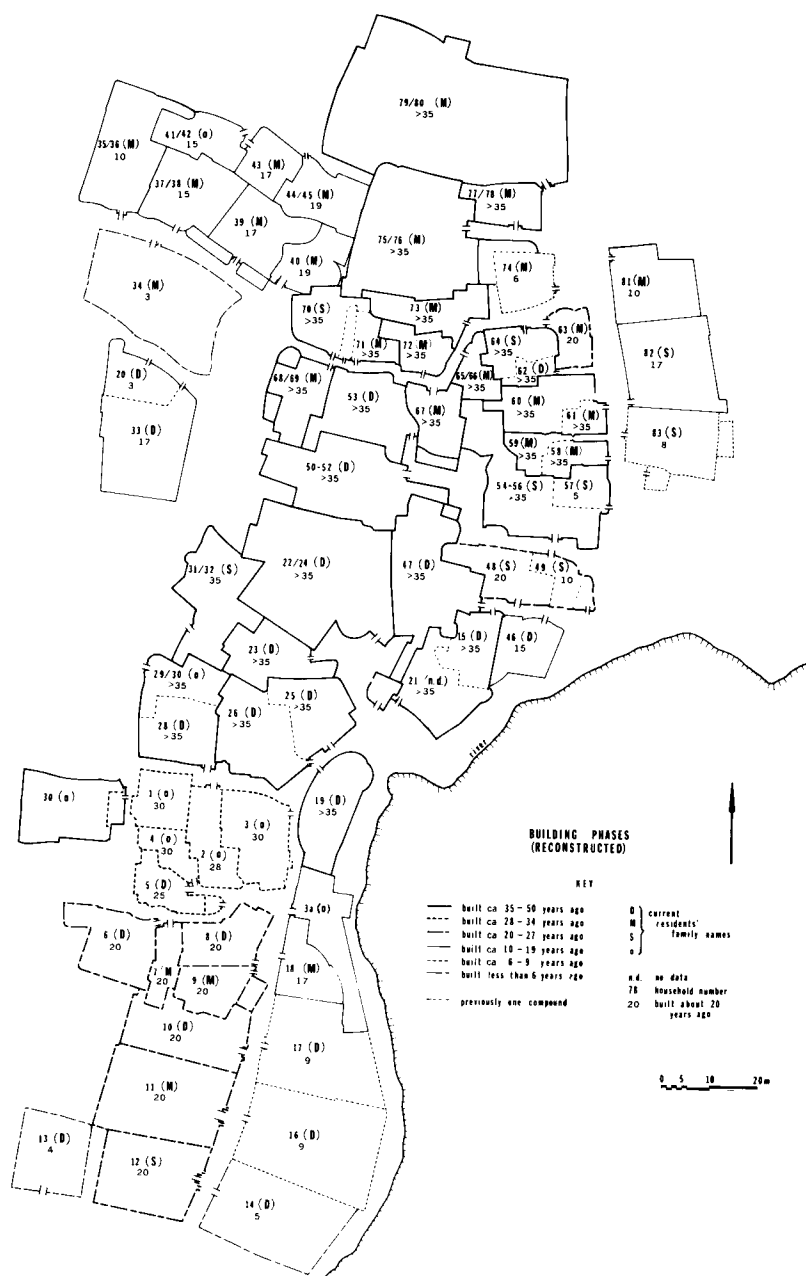
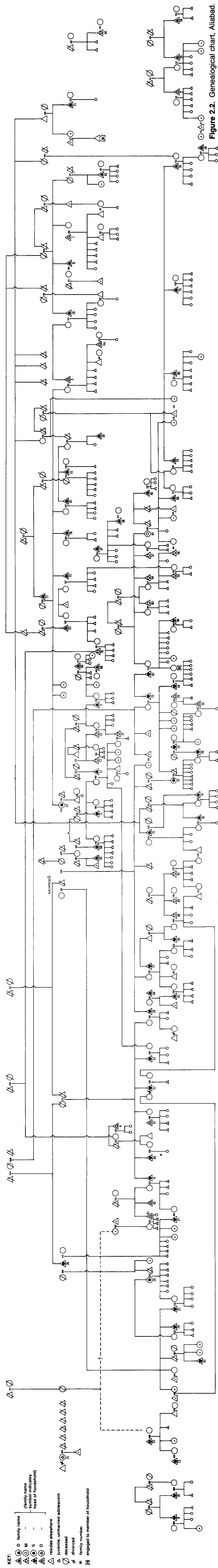


Figure 4.20. Chronology of houses and distribution of family names in Aliabad, 1975 A.D.



pounds 50 years ago is not known, but several of those in the northern end of the village (70 through 73; 62, 64 and 65/66; 53 and 68/69) were probably not subdivided as they are now. The vast majority of the younger compounds in Aliabad were described as having been built on empty lots or garden areas, and it is fairly clear that at that time the village was about half its present size.

In Aliabad, more recently built houses tend to be more rectilinear in plan than older structures; they frequently have ground plans in which two rooms flank the compound entrance (see Figure 4.18). In contrast, some older compounds are irregularly shaped, and sometimes partially curvilinear. The few circular rooms in the village are very tall and referred to as "towers," although they currently serve as kitchens. The peculiar shape of some rooms may reflect a previous function, and it is possible that Aliabad did once have towers and an enclosing wall like some that can be seen within a few hours' drive from the village (see Buckingham 1829/1971:154). Some of the village's younger houses are not only more regular in plan, but are considerably smaller in area than those of older, more northerly compounds. When these structures were built (20 to 30 years ago), the village threshing floor was located in the area now occupied by 33 and 34. Thus, construction in the village appears to have entailed a steady southward expansion (1 to 5, then 6 to 12) followed by an eastward movement between preexisting blocks and the river (3a, 16 to 18, then 81 to 83) and extension to the northwest (35/36 to 44/45). Most recently, there has been a filling in (34, 74) and slight extension to the south (13, 14). The same sort of spatial expansion seems to have occurred in Asvan, one of the few Middle Eastern villages whose architectural chronology has been discussed in detail (Hall *et al.* 1973:260ff.).

In 1975, informants in Aliabad said that there was very little room left in the village for construction of new houses. The areas in which new building was considered most feasible were garden plots within the village and, to a lesser extent, areas immediately to its south. It was not considered possible to extend the village to the east, because of the river, and the village cemetery was viewed as precluding expansion to the north. When asked where newly married sons would reside, some villagers enumerated these options, and also said that some existing compounds could be further subdivided. The expectation is that sons have rights to their fathers' compounds and inherit them upon parents' death or emigration, and that brothers may sometimes (eventually) subdivide their father's compound.

The tendency to subdivide an old compound to form two separate compounds is somewhat clearer in the older sections of the village, perhaps in part because households living in Aliabad's younger houses have not yet grown to the point where there is (perceived) overcrowding. The spatial fissioning of 60 and 61 (parents and son), 57 and 54 (two brothers), and 58 and 59 (two brothers), among other cases, appears to represent a compromise between the ideal of neighborliness of near patrilineal kin and the desire to mark economic distinctions between households. It would appear that spatial and structural distinctness is, at least in

part, a function of householders' perception that they are crowded and therefore cannot continue to coreside within the same compounds. Apparently, if a compound is deemed sufficiently large, it will be subdivided to create separate spaces for close patrilineal kin (e.g., 33/20, 25/26) rather than left intact while such kin move to a more distant location. On the other hand, if a compound is considered too small to subdivide, its departing residents often attempt to purchase a house lot as close as possible to their patrilineal kin (e.g., 29/30), and within one of the more recent sections of the village, several pairs of houses built separately reflect this preference (e.g., 16 and 17, 8 and 10, and 11 and 12). However, even some of the village's younger houses (6, 11, 12, 13) reflect construction carried out as a result of overcrowding in older houses in which their occupants formerly resided; thus, some of Aliabad's newer houses reflect a filial "budding off" from preexisting households located in other parts of the village.

Both house exchange and sale are currently legal, and are not uncommon.⁴⁴ Some standing houses (as opposed to house lots) have been sold by households emigrating from the village (e.g., 23, 62, and 83), but in at least four cases houses were gifts made to their present occupants. The widow in 21, with limited means of support, was given her house by the (now deceased) head of 61. One uncle (35) gave his house to a nephew (71) when he built a new one for himself, and another (39) received his house from a nephew (80). In a fourth case, a brother (11) gave his old house to his sister and her husband (53). All of these donors were landowners.⁴⁵ Another house (28) was built by the former headman for a son, who has subdivided it and sold a portion (to 29/30), presumably because he did not require such a large area. The same headman seems to have built houses 31/32 and 23 (probably originally a single structure, built for a daughter and her immigrant husband).

SUMMARY AND ARCHAEOLOGICAL COMMENT

Through a fortunate combination of building materials and climatic regime in the area, prehistoric architecture in central western Iran is frequently well preserved, and it seems likely that recognizable remains of Aliabad's residential architecture will eventually be incorporated into the archaeological record. In the preceding pages some salient features of Aliabad's structures have been described, and some causes of differentiation of areas within houses and of variation

⁴⁴Villagers purchasing garden land for new house construction reportedly pay what they would for fields if they could be transferred. In 1975, the head of 30 was building on a garden recently purchased from 1; this will allow this young family to establish a household near but distinct from that from which it is fissioning.

⁴⁵Charity is an important Muslim value, and one held in high regard by Aliabadis. Sources of funding for acquisition of house lots in several comparable cases (13, 16, 34) are not known to me, but available data strongly suggest that gifts from better-off fathers-in-law and uncles were involved.

among houses have been suggested. It has been argued that unroofed areas are readily distinguishable from those that are roofed, or architectural; within architectural areas, the unroofed courtyard has certain attributes which distinguish it from roofed areas, and it is probable that such differences would be observable archaeologically. Within roofed areas, a combination of vertical and horizontal surfaces and built-in features serves to permit a fairly easy identification of rooms' functions. In a formally similar archaeological site, it is likely that the most recent functions of rooms could be established, and perhaps their earlier functions as well, with careful stratigraphic excavation followed by systematic dissection. If room types could be distinguished archaeologically, it might be possible to reconstruct not only activities, but other aspects of village life as well.

Architectural data from Aliabad have been used to examine relationships among selected variables, and a number of statistical correlations have been reported. It would be difficult to argue from these figures that any single variable can be used as a measure of household size, composition, or wealth, since the data set is small and is derived from a single community, and both the metric and discontinuous architectural variables discussed here display considerable diversity for a number of reasons. Rather than demonstrating clear-cut or invariable associations, the Aliabad data suggest that demographic and economic diversity on the community level may have patterned material correlates. Systematic examination of architecture in other villages should flesh out the patterns suggested here and, with a sufficiently large sample from any given settlement, future research should improve our understanding of the relationships between architectural variability and household and community organization.

In Aliabad, such built-in features as troughs, ovens, and hearths identify a room's functions, but they do not seem to be clear markers of either relatively larger household population or relatively greater household wealth. Bins may be useful estimators of household population but not necessarily of wealth. Number of dwelling rooms is related to household composition (with each nuclear family generally occupying its own room) and, perhaps, to economic rank (wealthier households are usually those owning land; the landowning segment has a higher frequency of extended-family households, and thus more dwelling rooms). Compounds of wealthier households are generally larger than those of poorer households, and two-story houses may be more closely associated with (comparative) wealth than with number of coresiding families.

Architectural modifications made as a result of changes in household economic status, or with changes resulting from transitions in the domestic cycle, may be rapid and subtle. Building phases and recycling⁴⁶ of activity areas are not

⁴⁶Recycling of rooms has also been discussed by David (1971) and Horne (n.d.). They report that, as in Aliabad, some elements of functional change that occur in the recycling of architectural areas have "directionality." A stable, for example, would not be converted to a sleeping room, although a living room (or kitchen) might well be transformed into a stable.

likely to be readily reconstructed from archaeological remains, but such reconstructions are at least theoretically possible. Ethnographic observations suggest that over time architectural transformations accompanying changes in the domestic cycle may result in both an areal expansion of settlements and an increase in their population density. Although it might prove difficult for an archaeologist to establish the absolute chronology of residential structures within the remains of a village like Aliabad, a determination of the relative chronology of individual adjacent houses, as well as the identification of subdivided compounds, should be possible, given meticulous microstratigraphic excavation. Despite the theoretical and methodological problems that they would pose, the archaeological remains of such a village should reflect some of the economic and demographic diversity that had existed among its households. For an archaeologist excavating this or a comparable settlement, the problem would seem to be not so much in discovering that village households had not been identical, but in obtaining a representative sample from which the ranges of variation could be established, and on which efforts to specify their causes could build. For a number of reasons, it might be advisable to evaluate the remains of such settlements in the light of a larger regional sample.

The following chapter turns from the narrowly defined local level, the settlement treated here, to a consideration of its broader regional context. Variability among contemporary and recent historic settlements in the central western Zagros, and the potential relevance of such settlement data to collection and analysis in archaeological site surveys, are discussed.

5

The Larger Setting: Regional Analysis and Ethnoarchaeology



The preceding chapters focus on a small, nucleated, rural settlement in the central Iranian Zagros. Such localized communities become sites, which in Southwest Asia have traditionally been the primary targets of archaeological research. This emphasis on the individual archaeological site has in a sense paralleled the “community study” orientation so popular among social and cultural anthropologists, and it has been marked by the painstaking development of local sequences, the establishment of relative chronologies for neighboring regions, and the determination of the absolute chronological placement of sites and assemblages. This essential empirical framework having been developed, much recent archaeological work in Southwest Asia has turned to broader questions. Increasingly, theoretical issues now being investigated involve fieldwork on a regional rather than local scale. The proliferation of regionally oriented studies, which rely heavily on surface survey, is testimony to significant shifts in research priorities and methods. Some surveys have utilized site sizes and distributions to reconstruct local and regional population sizes, changing patterns of land use, and aspects of economic and political organization (examples are Adams 1962, 1965, 1981; Adams and Nissen 1972; Johnson 1973, n.d.; Levine and McDonald 1977; Mortensen 1974, 1975; Sumner 1972; Wenke 1975–1976; Wright *et al.* 1979). Such studies differ from earlier site surveys in that locating a

“good” site for excavation is not their primary objective. They reflect the recognition that some aspects of change are best investigated on a regional scale and, if only implicitly, they reject the notion that a single site can or should be considered representative of all the prehistoric communities in an area. Rather, a regional approach assumes that sites are differentiated, and articulate with one another in the framework of a larger system (see Johnson 1977).

The following pages turn from the level of the individual village to a consideration of contemporary settlement and land use patterns on a broader scale. Selected ethnographic and ethnohistoric data from the Zagros area provide an additional and in some ways contrastive referent for archaeologists familiar with the neighboring alluvial lowlands of Khuzistan and southern Iraq. Focusing on the region around Aliabad, this chapter complements and extends the ethnographic description of the preceding chapters. Rather than assuming that Aliabad (or any other single settlement) is “typical” of the Kangavar area, I enlarge the contemporary sample, suggesting that while Aliabad may be considered an “average” village in some respects, there is also a range of variation in some archaeologically relevant features of settlements. The following review also suggests that as the scale of observation is increased, there is increasing variability among settlements. This has implications both for archaeological sampling and for understanding the character and relationships of ancient sites.

It cannot be assumed that site organizations, sizes, and distributions have remained unchanged over the past 10 millennia; archaeologists demonstrate what these patterns have been. Likewise, we cannot assume that today’s environmental constraints were operable in the past; an array of paleoenvironmental data are required to complement and clarify interpretations based on data for the locations and contents of sites. Chapter 2 provides selected information on contemporary land use, and some of the rather limited and problematical data on prehistoric environment in western Iran are reviewed in Chapter 6. Here I discuss some aspects of contemporary site size, organization, interaction, and distribution which bear on the interpretation of archaeological remains.

Archaeologists working in Southwest Asia have used surface remains collected from several sites within a region to approach a variety of problems. Among those to which contemporary data are relevant is the reconstruction of prehistoric population parameters, not an end in itself but rather a means to explore such theoretical issues as the causes of state formation (see, among others, Hassan 1978; Weiss 1977; Wright and Johnson 1975). Another is “carrying capacity” and the ways in which it changes through time insofar as land use and productivity are bound up with demographic, technological, and organizational changes (discussed, for example, in Adams 1965). Archaeologists have also investigated changing interactions among settlements, a topic that has figured in discussions of prehistoric exchange (Johnson 1975), social organization (Plog 1976), and political relationships (Johnson 1980). Each of these issues is fraught

with methodological and theoretical difficulties. The intention here is not to attempt to resolve them, but rather to explore some of them in a contemporary context and to suggest areas for future research. The data for Aliabad, viewed from a larger perspective, suggest that it might provide a useful model in interpreting excavated remains of archaeological settlements comparable in form; the regional pattern outlined here should interest archaeologists utilizing surface survey data. It is to some of those features of this larger contemporary landscape that we now turn. This material provides a backdrop to a small corpus of archaeological materials from the same area discussed in Chapter 6.

EXTENDING THE SAMPLE: SETTLEMENT IN THE ALIABAD AREA

Anthropologists have used the term “settlement pattern” to refer both to the internal organization of a single settlement and to the patterning of settlements in the landscape (Chang 1968; Parsons 1972). Spatial relations among sites of differing size and function are commonly thought to reflect an underlying system that integrates them; archaeologists observe patterns and from them attempt to reconstruct systems. Interpreting the contemporary settlement pattern in the Kangavar area in terms of an underlying system would require treatment of monographic length and, at present, insufficient data are available for this region to do so adequately.¹ However, it is possible to describe some aspects of the contemporary settlement pattern that might eventually be reflected in archaeological survey data.

As Figure 5.1 indicates, contemporary settlements in the immediate vicinity of Aliabad appear to be scattered about the topographically uneven landscape characteristic of the central Zagros. Although many settlements are situated along the tributaries of the Gamas-i Ab, a number of others shown in this map are not. These obtain water from wells and/or from *qanats*. Each village is

¹In the following discussion, this area is often termed a “region” or part of a “region,” but topographic and cultural boundaries are not sharp. The definition of regions and their boundaries poses problems for both archaeologists and geographers. *Region* as somewhat loosely used here refers to an area that appears to have some ecological and cultural features distinguishing it from adjacent areas; the portion discussed in detail here was defined rather arbitrarily in order to be assured of a sample of 100 settlements (including Aliabad and the two towns Kangavar and Asadabad). Due to mapping and recording errors in the relevant census publications, two places initially included within the area shown in Figure 5.1 were eliminated from the sample when it was discovered that they are not settlements. Some features of settlements in the Kangavar area are discussed by Goodarzi-Nejad (1974).

Aliabad is in Hamadan province, of which the city Hamadan is the capital. In the 1966 census, Iran had 21 such administrative units (province: *ostan* or *farmandarikol*). These are subdivided into urban areas (*shahrestans*), each headed by a township (*shahr*, “city”), such as Tuyserkan ($N = 146$). *Shahrestans* are subdivided into districts (*bakhsh*), such as Kangavar and its environs. Finally, districts are subdivided into administrative units (*dehestans*), whose components are settlements with fewer than 5000 inhabitants (*dehs*, or villages, such as Aliabad).

surrounded by its fields and pastures, although in some cases inhabitants of one settlement may own fields within the area surrounding another. The growing requirements of the major subsistence crops are probably an important factor determining the locations of settlements. In the area shown in Figure 5.1, elevations range from about 900 to about 2700 m above sea level. Wheat is rarely grown above about 1800 m, and although many of these villages are at elevations between 1524 and 2134 m, none is higher. Figure 5.2, indicating the major roads in the area, does not include the numerous tracks that provide additional links between rural settlements. Such tracks, and the secondary roads shown here, are easily traversed by people and donkeys for much of the year, and

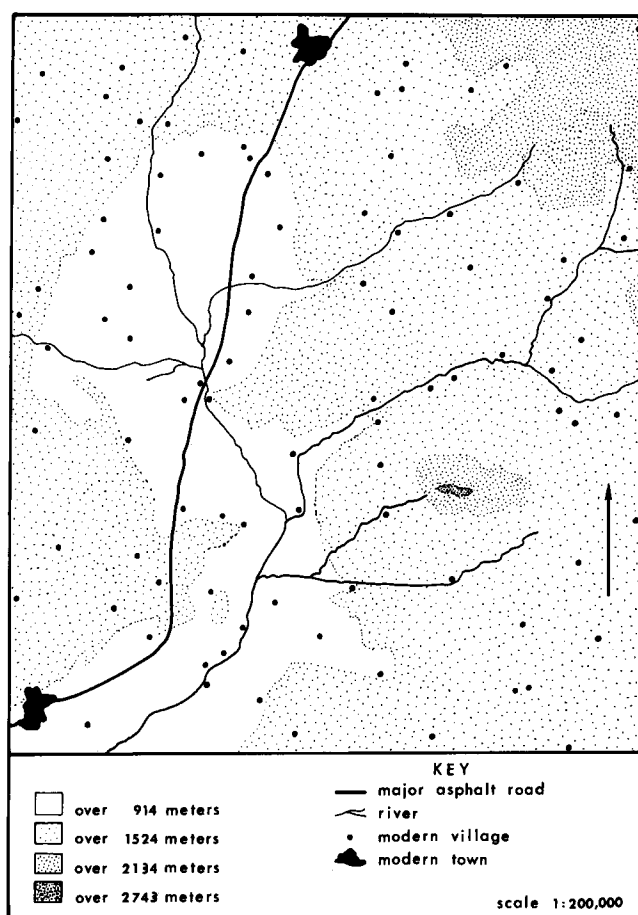


Figure 5.1. Topographic map, Aliabad area. Source: Government of Iran 1970a, 1970b.

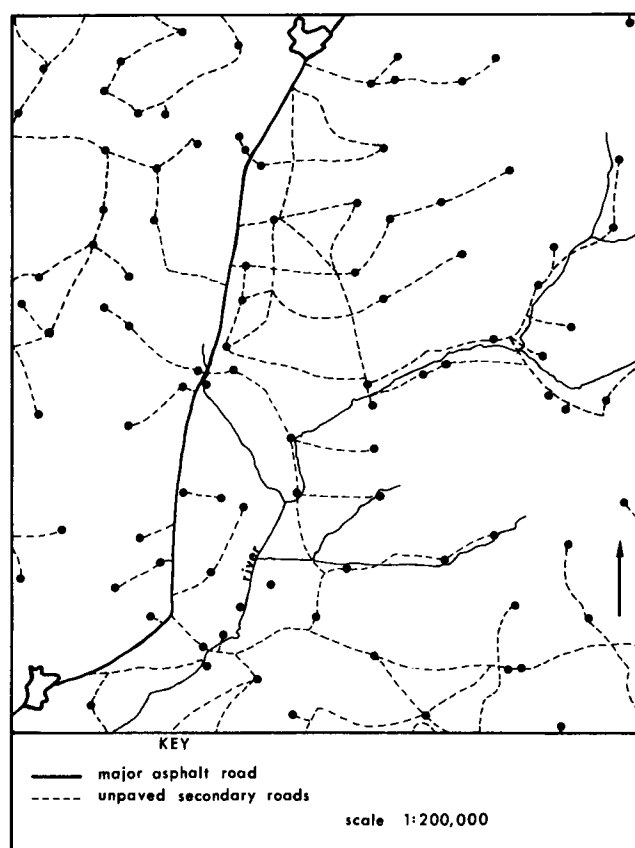


Figure 5.2. Road network, Aliabad area. Source: Government of Iran 1970a, 1970b.

movement between neighboring villages is frequent. On average, distances between villages are less than 2 km.²

It is possible to see at least one other village from many of the 96 villages shown in Figures 5.1–5.3, but because of topographic irregularities, that village is not always the nearest one. Sometimes large public gatherings in nearby villages are visible and are discussed, and important information travels rapidly among settlements. Because there are no reliable available histories of these individual rural settlements, it is not possible to specify whether village locations and sizes have changed in relation to modifications in the road system or growth of regional centers, nor to evaluate historical relationships among neighboring

²Villages are randomly distributed, with a nearest-neighbor distance of 1.7 km ($R = 1.06$; $z = 1.2$).

villages. For example, in western Iran one often encounters two or three neighboring villages with the same name. In such cases, each name has a modifying adjective, such as “above,” “below,” and “in between” or “middle”. It is likely that in at least some such cases there are close connections among their inhabitants, and one suspects that the village names may reflect a sequence of settlement fissioning or “budding off.” Old maps of the Kangavar area shed little light on such questions, because villages not readily accessible from the major roads between Kermanshah and Hamadan were rarely visited during the eighteenth and nineteenth centuries by foreign travelers fearful of bandits (e.g., Buckingham 1829/1971). Even some detailed maps of the Kangavar area made during the 1930s and 1940s do not include villages known, from other sources, to have existed at that time.

Many villages in this area have at least one “shop,” often a single room within or attached to a house, where a small range of items may be bartered or purchased. Some foods (including meat and produce) and other household items (like mirrors, textiles, spindle whorls, and pottery) are brought to villages by itinerant merchants, visiting craftsmen (such as the felt-maker), and transhumant white-tent “tinkers,” who specialize in sieves and other agricultural implements (see also Watson 1979). Even some health-care services are provided by itinerant specialists, such as barbers who double as dental “surgeons.” Some veterinary and medical care has been provided by trained traveling government employees, but in 1975 their visits were neither frequent nor regular. Some basic necessities are most readily obtained in larger settlements like Kangavar and Asadabad, shown in Figure 5.1. These include kerosene and other fuels, some canned and imported foods, pharmaceuticals, and bulk quantities of staple foods, along with a variety of services (postal, banking, medical, and a range of others, provided by governmental agencies and private entrepreneurs). Villagers often travel to these centers partway on foot. Tuyserkan (Figure 1.1), located at twice the distance (from Aliabad) and (in 1975) over a much less efficient road system, has a slightly larger population than Kangavar, comparable services, and a higher rank in the central government’s administrative hierarchy (see note 1). Aliabadis rarely visit Tuyserkan, despite the fact that it is the administrative center responsible for their certificates of birth, marriage, and death, the source of information about voting and conscription, and the base of the mobile governmental veterinary and medical teams serving Aliabad’s environs. Thus, on this local level, it would appear that in the “free-market” economy of 1975 and preceding years, the movement of goods and people between rural settlements and larger centers was more strongly influenced by center accessibility (including proximity) than by administrative considerations.

On the larger scale, the villagers of Aliabad and nearby communities prefer to visit the provincial capital of Kermanshah rather than Hamadan, despite the fact that they are within the legal jurisdiction of the latter. In terms of much of these

villagers' actual behavior, the existence of a political jurisdictional boundary is largely irrelevant. Locational factors are probably operative here as at the more local level. Kermanshah is about 100 km from Kangavar, and Hamadan, about 110. There is a more difficult mountain pass on the Hamadan road than the one terminating in Sahneh, on the route to Kermanshah. Much travel to these provincial capitals originates in Kangavar, at its bus stop or taxi stand. Finally, Kermanshah is preferred partly because it is a Kurdish town, whereas in the somewhat more cosmopolitan town of Hamadan, Persian and Turkish are the languages most commonly spoken, and people in rural or "tribal" dress are seen less frequently; vacationing Tehranis are more numerous.³

VILLAGE POPULATION, AREA, AND DENSITY

Most of the data discussed here have been assembled from various publications based on Iran's 1966 census. These census and gazetteer volumes contain figures on village population, number of households, and holdings in land and animals. Areas of towns and cities are shown on maps drawn at a scale of 1:200,000, but the gazetteers do not provide settlement maps or other areal data for settlements not defined as towns. However, it was possible to measure the areas of a small sample of villages ($N = 41$) by using a compensating polar planimeter on some aerial photographs taken during 1969 (Tables 5.1 and 5.2). For much of the following discussion, the base year is 1966. Although this is 9 years earlier than my fieldwork in Aliabad, and antedates the aerial photographs by 3 years, there is no evidence that relationships among settlements had substantially or significantly altered during this period. Although settlement populations may have grown slightly between 1966 and 1975, it is assumed for operational purposes that this growth characterized all of the villages in the area. During the 3-year period between 1966 and 1969 such growth, perhaps coupled with areal increase, was probably not substantial enough to warrant a rejection of the areal data derived from the photographs.

It should be noted that census data tend to have inherent limitations (Haggett 1965:185ff.). For example, in contrast to some other publications based on the

³Throughout Iran, Hamadan is generally recognized as a pleasant location during the summer months, and Iranians refer to it as "cool." Among Europeans, the very distinct impression in 1975 and for some years previously was that Hamadan was more cosmopolitan than Kermanshah (despite the fact that in 1966 it had a smaller population). One may speculate that along with this, and its attractiveness to vacationers from the capital, went more overt discrimination against rural people (who in the 1960s and 1970s were sometimes treated quite poorly by urbanites) than was the case in Kermanshah. In the early 1970s, one of the many reasons that Kermanshah seemed smaller and less cosmopolitan to a westerner was that it was not unusual to see flocks of sheep driven down the main streets, whereas this would have been a somewhat startling sight in the center of Hamadan. Like Hamadan, Kermanshah is a provincial capital; Hamadan is about a 6 hours' drive from Tehran, and Kermanshah is almost 2 hours farther on the same road.

1966 census, village gazetteers for the Kangavar area do not distinguish between “households” and “housing units.” Lacking other definitions, it is necessary to assume that households recorded in the village gazetteer are phenomena of the same order as those discussed in volumes treating towns and cities, consisting of

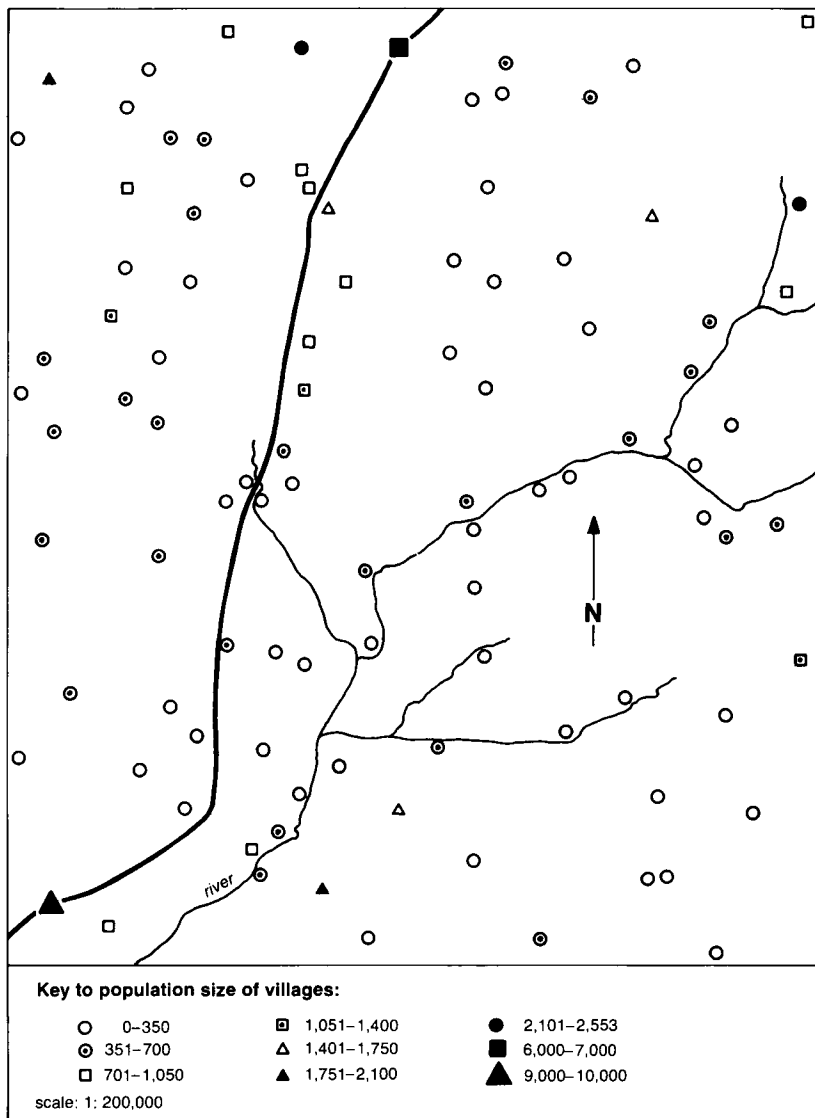


Figure 5.3. Population size of settlements, Aliabad area, 1966 A.D. Source: Government of Iran 1970a, 1970b.

coresiding persons sharing living expenses and principal meals. Informants' accounts suggest that the 1966 census data provided for Aliabad support this assumption. Although the number of houses in villages other than Aliabad is not available, it seems legitimate to assume that a village recorded in the census as having more households is larger than one recorded as having fewer. It is therefore possible to compare villages and towns in terms of numbers of households (and hence of mean household sizes). However, because not all of the census publications include data on houses, it is not possible to compare different-sized settlements in terms of their residential structures per se. In the absence of ethnographic documentation, it must be assumed that the census data for western Iran are useful even though they must be interpreted with some caution.

In an area of about 1040 km² (Figures 5.1–5.3), there was, in 1966, a total population of 62,933. The majority of these people (46,805, or 74%) were rural, distributed in a total of 96 villages. The remainder lived in Kangavar and Asadabad, towns on the main Tehran–Baghdad road. Table 5.1 illustrates some of the other features of the rural population. Sixty-eight (71%) of the 96 villages had populations of 500 or less; the distribution of both rural and urban population in this area suggests that if it were translated into areal form, the (population) size hierarchy evident in Figure 5.3 (and gaps between size classes) might be visible archaeologically.

Table 5.1 also includes a sample of 785 villages in the area extending east to

TABLE 5.1
Kangavar Area Villages, 1966

Sample	N	Village population			Number of households			
		Total population	$\bar{X}$ (median)	Range	Range	Total	Households per village, $\bar{X}$ (median)	Household size, $\bar{X}$
Aliabad	1	418				67		6.0
Aliabad area ^a	40	13,836	346 (256)	38–1806	5–305	2,596	65 (48)	5.3
Kangavar–Asadabad area ^b	96	46,805	483 (325)	28–2553	4–496	8,844	92 (66)	5.3
Hamadan–Kermanshah area ^c	785	310,039	395 (248)	8–4616	3–908	59,458	76 (49)	5.2

^a Aliabad not included.

^b Populations of Kangavar and Asadabad proper not included.

^c Urban populations of Hamadan and Kermanshah not included.

Hamadan and west to Kermanshah.⁴ In addition to the population shown in Table 5.1, a few people resided permanently in the roadside restaurant-hostels referred to as tea houses, and there was also an urban population totaling 192,892 in nine towns. (See Tables 5.6 and 5.7. This figure includes Hamadan but not Kermanshah; the urban population is not included in the computations enumerated below.) This larger sample is associated with a greater range in settlements' population sizes. In addition to enlarging the data set and indicating something of the range of variation in settlement (population) size, this larger sample thus suggests that diversity or variability observed may, at least in part, be a function of the scale used in observation and analysis.

Many archaeologists are interested in the relationships between settlement area and population. Although the village gazetteers do not include areal data for small-scale rural settlements, it was possible to obtain such information for a small sample of villages in the immediate vicinity of Aliabad (Table 5.2), and for an even smaller group of towns and cities for which detailed maps were available through the Cartographic Institute in Tehran and in other published sources (Table 5.6). From these areal data it is possible to suggest some rough relationships between population size and settlement area in central western Iran. For example, data for 40 villages near Aliabad reflect something of the range of variation on a fairly local level within a regional context.⁵ Settlement area for this sample ranges from .5 to 13.7 ha, with a mean of 3.4 and a median of 2.5 ha. Average settlement density is 97 persons per hectare, and there is a very strong positive correlation between village population and settlement area.⁶

Table 5.3 displays some comparative data for contemporary rural settlements elsewhere in Southwest Asia. With a few exceptions (e.g., Bahtili), those settlements for which density can be computed are nucleated rather than dispersed. Inspection of Table 5.3 indicates that in this small and heterogeneous sample of villages (covering an area extending from eastern Iran to Anatolia and the eastern Mediterranean), density ranges from a low of about 20 persons per hectare of settlement area (in dispersed settlements) to highs near 200 in Khuzistan and Kufr al-Ma (Jordan). Settlement densities appear to be relatively low in the Turkish villages; with the possible exception of the incompletely mapped Yas-sihoyuk, they are less than 100 persons per hectare. Higher densities obtain in some of the Zagros villages tabulated, ranging from 86 to 147 persons per hectare of settlement area. Aliabad, with its 1975 population of 418 and density of 139

⁴This area was chosen to include higher-order centers than those in Figure 5.1. Its boundaries correspond to those mapped in the gazetteer (*shahrestan* and *dehestan* boundaries, for the most part); some of these, of course, correspond to topographic "boundaries" (e.g., rivers).

⁵These data may include minor measurement errors reflecting topographic variation and distortions in the aerial photographs. The 41 villages listed in Table 5.2 include Aliabad, and are among the 96 villages referred to above. The comments that follow apply to the 40 villages other than Aliabad. An aerial photograph and informants' accounts indicate that in 1969 Aliabad had 63 houses. In 1975, it had 67 houses. During the period 1966–1975, the number of households increased by about 10 and mean household size increased by about 1 (see Chapter 2, note 3).

⁶Here $N = 40$, $r = .95$, $p \leq .01$.

TABLE 5.2
Selected Characteristics of Forty-one Allabad Area Villages, 1966-1969^a

Village	Population	Number of households	Household size, $\bar{X}$	Site area (ha)	Site density (persons/ha)
1	1806	305	5.9	13.3	135.8
2	1448	272	5.3	13.7	105.7
3	782	150	5.2	9.4	83.2
4	724	110	6.6	6.0	120.7
5	688	136	5.1	4.6	149.6
6	515	105	4.9	7.9	65.2
7	506	79	6.4	6.1	82.9
8	501	82	6.1	5.1	98.2
9	458	75	6.1	4.3	106.5
10	451	93	4.8	4.0	112.8
11	437	89	4.9	>3.1	<140.9
12	426	81	5.3	>3.2	<133.1
13	403	87	4.6	3.7	108.9
14	392	75	5.2	4.0	98.0
15	356	66	5.4	2.6	136.9
16	325	72	4.5	2.4	135.4
17	322	61	5.3	2.5	128.8
18	300	60	5.0	2.8	107.1
19	296	63	4.7	2.4	123.3
20	261	53	4.9	2.0	130.5
21	260	57	4.6	2.8	92.9
22	242	38	6.4	1.9	127.4
23	201	41	4.9	1.5	134.0
24	195	43	4.5	2.8	69.6
25	187	32	5.8	1.5	124.7
26	169	30	5.6	2.0	84.5
27	145	32	4.5	2.4	60.4
28	132	23	5.7	2.6	50.8
29	124	24	5.2	2.3	53.9
30	121	22	5.5	1.7	71.2
31	121	23	5.3	1.0	121.0
32	115	19	6.1	.96	119.8
33	113	18	6.3	2.2	51.4
34	112	54	2.1	1.8	62.2
35	112	22	5.1	1.5	74.7
36	86	11	7.8	1.3	66.2
37	82	17	4.8	.8	102.5
38	78	16	4.9	2.3	33.9
39	62	14	4.2	.8	77.5
40	38	5	7.6	.5	76.0
41	69	13	5.3	1.2	57.5

^a Population and household data are drawn from the 1966 census; areal figures are based on 1969 aerial photographs. Areal data for villages 11 and 12 are incomplete; their densities are therefore slightly lower than shown here.

TABLE 5.3
Population and Settlement Area in Selected Contemporary Rural Southwest Asian Settlements^{a,b}

Village(s)	Site area (ha)	Site population	Site density (persons/ha)	Regional density (persons/km ²)	Household size, $\bar{X}$	Fields (ha per capita)	References
Aliabad (1975)	3.0	418	139	45	6.2	.72	Kramer 1980
Aliabad area (N = 40)	3.4 ($\bar{X}$)	345 ($\bar{X}$)	97 ($\bar{X}$)	45	5.3	1.14	Tables 5.2, 5.8
Hasanabad	1.4	180	132.3	n.a.	4.4	1.0	Watson 1978, 1979
Rust	6.6	700	106	n.a.	5.6	1.1	Galloway 1958
Walash	.8	90	113	n.a.	6.4	1.7	Leach 1940
Tell-i Num (older)	5.7	490	116	22	8.7	n.a.	Jacobs 1979
Marv Dasht area (N = 110)	2.1 ($\bar{X}$)	312 ($\bar{X}$)	147 ($\bar{X}$)	22	n.a.	1.9	Sumner 1972, 1979, personal communication
Alisar	4.3	292	67.9	n.a.	5.0	4.0	Morrison 1939
Yassihoyuk	1.5(?)	355	236.7	n.a.	4.7	4.0	METU 1965
Asvan	12.6	440	34.9	12	5.5	9.1	Hall <i>et al.</i> 1973; Hillman 1973a; Wagstaff 1973
Bahtili	27.7	671	24.2	20	5.5	1.2	Kolars 1963
Akdamlar	6.0	237	39.5	20	7.4	.3	Kolars 1963
Davarabad	10.0	630	63	n.a.	4.5	.62	Alberts 1963
Baghestan	2.0	169	84.5	10	5.1	.19+	Government of Iran 1977; Home and Martin, personal communication
Turan (N = 13)	1.5 ($\bar{X}$)	87 ($\bar{X}$)	56 ($\bar{X}$)	10	4.1	.31	Government of Iran 1977; Home and Martin, personal communication
Muhiabad	48.9	1004	20.5	n.a.	3.9	n.a.	English 1966
Kousar Riz	28.3	171	6.0	n.a.	n.a.	n.a.	English 1966
Sehkunij	22.3	236	10.6	n.a.	n.a.	n.a.	English 1966
Khanazariya	1.5(?)	210	140	n.a.	6.5	n.a.	Nissen 1968
Sayeh South	6.0	96	16	n.a.	6.0	n.a.	Wright 1969
B'dair	24.0	1587	66	n.a.	5.6	n.a.	Wright 1969
Daghghara	23.0	2965	128.9	n.a.	5.6	n.a.	Wright 1969
Raddadeh (older)	7.0	450	64.3	n.a.	6.0	2.1	Rouholamini 1973; Dolfus, personal communication
Dez pilot area (N = 54)	1.1 ($\bar{X}$)	213.9 ($\bar{X}$)	208.8 ($\bar{X}$)	46	5.1	1.9	Gremiliza 1962
Tell Toqaan	5.0 (?)	319	63.8	n.a.	5.6	3.4	Sweet 1960
Kufr al-Ma	11.2	2027	181	n.a.	7.6	.78	Antoun 1972

^a Unless noted, figures on population, number of households, and village landholdings were provided in sources cited. In some cases, landholdings were given in units other than hectares and were converted for this table. It has been assumed that all population figures include children. Village holdings shown here include arable land, "wasteland," and grazing land. In some cases, sources specify that arable land is cultivated in an alternate-year fallow cycle; thus, the hectares per capita figures shown here may be too high for any given year. In some of these villages, a portion of the yield is given to a landlord. However, since information pertaining to hectareage and dues to owners is not uniform, totals given are used here as though no rent were paid and no fallowing practiced. The one exception is Aliabad (see Chapter 2). The abbreviation n.a. indicates that data were not available.

With the following exceptions, village areas were computed from planimeter measures of maps provided in sources cited. Alisar is described as 5 ha in extent (or 13.6 ha if the threshing floor and cemetery are included); for the sake of consistency, the planimeter measure has been used. The figure for the area of Bahtili was provided by Kolars (1963), and the figure for Tell Toqaan is an estimate based on a panoramic photograph published by Sweet (1960). The figures for hectareage in Kufr al-Ma are given by Antoun (1972). For Hasanabad, the area is smaller than that published by Watson, who very generously provided me with data, manuscripts, and a copy of the village map before her monograph was published (1979). The reason for the difference is that the measure used here omits nonarchitectural areas at the village's periphery. Watson (personal communication) provided the population figure of 180; the more recently published 193 (in a total of 2.4 ha) is not used here (see Watson 1978).

^b The following information pertains to individual settlements. Only a portion of the abandoned village of Khanazariya was mapped, although two additional clusters of houses were described. The figure 1.5 ha for settlement area is based on the published description, but it does not include the reportedly open areas between house clusters. The figures shown for population refer to the total of 30 houses. For the 17 houses mapped, the population was 110, in an area of about 9737 m²; this is a density slightly greater than 110 persons per hectare.

In Khuzistan's Dez pilot area 55 villages (of which one is omitted because it was not mapped), there was a total of 2274 houses, a total population of 11,585 persons, and a total hectareage ("sustaining area") of 22,311. As in other cases, the published areas of villages were measured with a compensating polar planimeter. Gremliža's data are widely cited in the literature of Southwest Asian archaeology, and are referred to below. All statistics given for these data are based on work done for the present study; other writers have made marginally different measurements and have therefore published slightly different correlations.

Asvan, a now-submerged village in the Keban Dam area near Elazığ, Turkey, was surveyed during 1971 as part of a multidisciplinary salvage project headed by David French. The architectural data were recorded during 1971, but the published population figures (440 persons, 80 "families") are based on Turkish records of 1938. The discussion of the village's history suggests that the population during 1971 was greater than it was during 1938, and that not all of the 12.6 ha of the village proper was inhabited during 1971. This is probably why the density figure shown here is so low (the figure for hectares per capita is probably also too low). A study of land use in Asvan indicates that the mean landholding of cultivable land was 12.2 ha per family (Hillman 1973a:239). Using the planimeter-derived figure of 4000 ha, and dividing by 80 (families), one arrives at a total of 50 ha per family which, with a mean family size of 5.5, suggests a sustaining area of 9.1 ha per person. In any case, Hillman also notes that within this part of Turkey, Asvan is unusual in its very large landholdings, which permit it to sell surplus produce to regional centers.

Because of the imprecise nature of the source for the village's area (a panoramic view of the village with humans, camels, and doorways used for scale), the population density for Tell Toqaan given here must be viewed as a rough estimate. Sweet (1960: Figure 4) provides a sketch map of the village, drawn by a resident, but it is not to scale.

Antoun (1972) conducted a census of approximately 75% of Kufr al-Ma. In his sample, mean household size is 13.1, for a sample population of 199 households with a population totaling 1294. The total village population provided by the village headman and viewed by Antoun as reliable is shown here. The figure (268) for number of households is derived from a schematic map published by Antoun, in which approximately 480 rooms are labeled with numbers up to 268. (In some cases, more than one of them are owned by the same household, but these are not invariably contiguous.) Antoun's maps also include information on the spatial distributions of houses and landholdings of members of the various descent groups of Kufr al-Ma.

I am indebted to Lee Horne for providing unpublished data on Baghestan, in northeastern Iran. As part of the Turan Project, directed by Brian Spooner (Government of Iran 1977), Mary Martin also conducted research in this village, and has also generously provided information about it and about the area in general. For comparative data on the Turan region, see the discussion of density below.

TABLE 5.4
Settlement Area and Population in Six Regions

Region	Number of settlements in sample	Settlement area (ha)			Settlement population			Density (persons/ha)			r (population and area)	References
		$\bar{X}$	Median	Range	$\bar{X}$	Median	Range	$\bar{X}$	Median	Range		
Aliabad, west Iran	40	3.4	2.5	.5-13.7	346	256	38-1,806	97	100	34-150	.95	Table 5.1
Marv Dasht, southwest Iran ^a	108	2.3	n.a.		315	250		137	n.a.	<10->390	.74	Sumner 1972, 1979
Dez River pilot area, southwest Iran	54	1.1	.76	.24-3.1	214	154	60-693	209	204	84-379	.85	Gremliza 1962; Wenke 1975-1976
Turan, northeast Iran	13	1.5	1.4	.6-3.1	87	93	16-178	56	59	15-105	.56	Government of Iran 1977; Horne, personal communication
South-central Iraq	15	65.2	36.1	14.5-372	23,767	4,000	1,000-200,000	365	183	55-538	.99	Adams 1981
Oaxaca, Mexico ^b	173	34.3	15.3	.1-1,128	34.6	496	8-72,370	94	38	4-1,860	.95	Kowalewski, personal communication

^a A sample of 110 settlements (Sumner 1979; personal communication) yields a mean settlement area of 2.1 ha, mean settlement population of 313, mean density of 147/ha, and a correlation coefficient (r) of .76. For this and all other r values shown except Turan ($p \leq .05$), $p \leq .01$. The abbreviation n.a. denotes data not available.

^b Published figures for the 1960 census of the valley of Oaxaca, and tracings of aerial photographs showing perimeters of censused settlements, were provided by Stephen Kowalewski and Catherine Brown of the University of Georgia. The valley's center, Juarez de Oaxaca (with a population of 72,370) is included here. The next largest settlement had a population of 6177 (at 181/ha, however, it is not areally the second largest).

persons per hectare, falls comfortably within this range, although in 1966 it was slightly more crowded than many of the 40 neighboring villages listed in Table 5.2. Although additional empirical data would be desirable, the ethnographic material on settlement density summarized in Table 5.3 strongly suggests that whether it is an oft-cited 200 persons per hectare, or a lower figure, such as 100, the application of a single density estimator is likely to mask the variability that exists across Southwest Asia.

Population size and density of small-scale settlements appear to vary from one part of the Middle East to another, but other features may be distributed widely throughout the area. For example, the range in mean household size shown in Table 5.3 is from 3.9 to 8.7, but the modal size is 5.5. This is not far from the family size (6) said by Aliabadis to be most desirable. This target figure, apparently predicated on an assumption of fairly high infant mortality, seems to occur widely in Southwest Asia.

There is also a tendency for settlement area to be positively correlated with settlement population. Table 5.4 shows the high positive correlations between the areas and populations of villages in the Aliabad region, the Dez Irrigation Project Pilot Area (Khuzistan), and the Marv Dasht plain (Fars), which, like the Turan area (Semnan), are also shown as aggregates in Table 5.3. The correlation coefficients shown in Table 5.4 indicate that despite regional variations in settlement density (which underscore the argument that different density estimators should be used for different regions), there is a strong association between population and area.

Table 5.4 shows six "regions" (phenomena of somewhat differing order) whose average settlement densities vary. The regions with the highest densities per settlement are that labeled Iraq and the Dez pilot area of neighboring Khuzistan. Those with the lowest site densities are Oaxaca (Mexico) and Turan. Aside from the Iraqi sample, consisting of small towns and one large city (Baghdad) at around the time of World War I (R. McC. Adams, personal communication), and the Mexican sample (which includes Oaxaca city and 68 smaller centers of varying size), the samples consist of rural settlements. The lowest correlation, in the Turan area of northeastern Iran, is interesting. This case may suggest some of the causes for interregional variations in settlement density. Unlike the other areas shown in Table 5.4, Turan is threatened by severe and prolonged desertification. Density in this region may be lower than it is in the other areas because of its comparatively heavy reliance on livestock. Settlements in this region may have more open spaces (because the price of farmed land surrounding villages is low unless it is irrigated; in building new houses, people may spread laterally rather than fill in between preexisting structures). Given subsistence adaptations in this area, it is possible that more of the structures within villages are nonresidential (i.e., stables, in particular), but also that more structures are abandoned, reflecting both loss of farmland to encroaching sand and

increasing emigration. There is a slim possibility that these figures reflect a sample bias, perhaps resulting from a series of lean years and/or the seasonality of the census, when some of the population may have been away. Despite environmental and economic differences, and a weaker association between settlement population and area, the amount of residential space per person (8 m^2) in Turan is closely comparable to that in the Zagros villages of Aliabad and Hasanabad.

The sources used in constructing Tables 5.3 and 5.4 include a study by Gremliza (1962), who focused primarily on issues related to public health. This study is virtually unique in providing details of material culture for a large sample, and it has accordingly been extensively cited by archaeologists working in the Middle East. The 54 villages for which Gremliza provides maps are less than about 3 ha in area, but settlement density at the high end of the range approaches 400 persons per hectare. The number of houses in the 55 Dez pilot area villages ranges from 7 to 139; the mean is 41 (the median is 30). There are strong positive relationships between village population, number of houses, and settlement area.⁷

Wenke has analyzed Gremliza's data in some detail. He suggests that when the 54 mapped villages are grouped into three size classes (as an archaeologist using site survey data might do), the (areally) largest have the lowest densities, 159 persons per hectare, and the smallest have the highest densities, 267 persons per hectare (Wenke 1975-76:75ff.). He concludes that the relationship of area to population varies with type of village, and that the use of a single estimator for all would be misleading. Gremliza himself comments on various types of village (1962:59), noting that formal variation depends partly on inhabitants' ethnolinguistic affiliations. Ehlers (1975:228) observes that in Khuzistan differences in village size are related to their age and location with respect to arable land of differing quality. The Dez River survey area as published by Gremliza provides an interesting contrast to Turan; its settlement densities, among the highest found in a literature review, suggest that one variable affecting differential density may be land prices, with higher costs perhaps obtaining even for unirrigated land in the Dez area, in contrast with more "marginal" areas like Turan. Additional details pertaining to soils, land use practices, village layouts, and developmental histories would be needed to evaluate a hypothesized relationship between settlement and regional densities and land values.

To the southeast of Khuzistan province, in Iran's southwestern highlands, lies the Marv Dasht plain, not far from Shiraz (Figure 1.1). Analyzing contemporary census and settlement data for this part of Fars province, Sumner (1979) has shown that density in 110 villages ranges from a low of 66 to a high of 293 persons per hectare. The mean for all villages is 147 persons per hectare, but

⁷As Table 5.4 indicates, the correlation coefficient (r) for population and area is .85. For area and number of houses, $r = .87$, and for population and number of houses, $r = .99$ ($N = 54$; all of these correlations have associated probabilities $\leq .01$).

Sumner suggests that for several reasons this figure may be inflated. As in Khuzistan, the central Iranian Zagros, and Turan, the Marv Dasht settlements are nucleated. Sumner suggests that differences in population density that may be related to settlement function may not vary greatly within a given level of a settlement hierarchy, but that they may vary substantially between levels (e.g., between "towns" as compared with "villages"), with towns having comparatively low densities, as appears to be the case in Marv Dasht town (Table 5.6). Sumner also suggests that variations in population density may be related to the duration of a settlement's occupation, and/or to the "cycle of village growth" (residential changes being made, for example, when perceived overcrowding outweighs the desirability of continuing to build within a village's old walls).

Sumner's suggestions are supported to some extent by Jacobs (1979), who describes a new but growing "suburb" of an old walled village in the Marv Dasht plain: the older village has a much higher density (116 persons per hectare) than its daughter settlement (53 persons per hectare). Although no such "budding" has yet occurred in Aliabad, a comparable process may have taken place there; it appears that over a 10-year period (1966–1975), despite increases in both area and population, density increased slightly (by about four persons per hectare). In an early study, Sumner (1972) had observed that within the Marv Dasht plain larger villages tend to be neither more nor less densely occupied than smaller villages. Yet in his sample a large village (of some 9 ha in area) had a population of about 2100, and therefore a higher than average density of 233 persons per hectare (Sumner 1972:Figure 3). Perhaps in this case density is a reflection of comparatively greater age. The question of density and its relationship to settlement age appear to merit further investigation. At the very least, the possibility that density may vary with age as well as a range of other variables might be considered by archaeologists using density estimators to reconstruct prehistoric population sizes and changes.

Nearer Aliabad, Braidwood and Reed (1957) also investigated the problem of population density. In their pioneering attempt to use ethnographic data in the interpretation of prehistoric remains in northeastern Iraq, they reviewed census materials for village populations and cartographic data for distances between settlements. Some of the census data which they reviewed were aggregated, but it appears that villages in the Chemchemal area (near Kirkuk) share some features found in the nearby Iranian Zagros. For example, mean village population in the period following World War II was reportedly 140 (Braidwood and Reed 1957:26f.). Of 185 villages, fewer than one-fourth ($N = 42$) had populations exceeding 200. Areal data for individual villages were not available to Braidwood and Reed, who could therefore not compute settlement densities. Their attempt to reconstruct ancient regional density, based on assumptions about sustaining area, is discussed below.

Some of the contemporary Zagros patterns suggested by the literature cited

here can be extended back into the nineteenth century by using information in Lambton's classic study (1953) of Iranian agrarian organization. Data for village sizes in the Malayer and Nehavand areas, not far from Kangavar, are displayed in Table 5.5 in partially reworked form (see Lambton 1953:156). These data suggest that despite deficiencies resulting primarily if not wholly from the nineteenth-

TABLE 5.5
Nineteenth-Century Population in Rural Malayer and Nehavand^a

Area	Number of villages	Number of families	Estimated village population ^b	Estimated total population
Malayer (1879–1880)	59	<50	125	7,375
	48	50–99	375	18,000
	24	100–199	750	18,000
	8	200–299	1250	10,000
	15	>300	1550	23,250
	82	n.a.	50	4,100
	236			80,725
Area	Number of villages	Number of peasants	Estimated village population ^c	Estimated total population
Nehavand (1880–1881)	7	<50	50	350
	14	50–99	75	1,050
	14	100–199	150	2,100
	20	200–299	250	5,000
	10	300–399	350	3,500
	7	400–499	450	3,150
	4	500–599	550	2,200
	2	>600	610	1,220
	78			18,570

^a These figures are taken from Lambton (1953:156); n.a. indicates data not available.

^b These figures are computed by using an arbitrary average family size of 5, and then multiplying 5 by the midpoint of the number of families in each class interval (i.e., 25, 75, 150, and 250). For villages larger than 300, the conservative figure 310 was used; like the sixth row, in which the arbitrary low village population of 50 (in 10 families/households) is assumed, this figure is probably too low.

^c Again, the midpoint of each class interval was used to compute the number of people. This figure was then multiplied by village number, to obtain an estimated number of individuals per class interval. Because these figures pertain to Nehavand and Khazal (west of Nehavand), the figure of 28,000 hectares provided by Veenenbos for Nehavand should be marginally expanded; comments herein regarding differences between Malayer and Nehavand appear to be further supported.

century recording procedures, village populations were in the same range that they are today (no areal data are available for this earlier period). In addition, although the Malayer area (about 75 km southeast of Aliabad) and the Nehavand area (about 50 km south-southeast) are of roughly comparable size—30,000 and 28,000 ha, respectively (Veenenbos 1959:5)—Nehavand apparently had far fewer villages than did Malayer, and the provisional population estimates shown in Table 5.5 suggest that it supported fewer people.

Lambton gives the Nehavand demographic data in terms of numbers of “peasants,” and those for Malayer in terms of numbers of “families” (households?). I assume that “peasants” refers to most if not all villagers. (However, if Lambton’s “peasants” refers only to household heads, the population figures would need to be multiplied by an estimator for household size. If the figure 5 were used, the reconstructed Nehavand population might be greater than that of Malayer.) The Malayer sample has many more villages than does that for Nehavand, but there are no population data for about one-third of them. In order to render these data sets comparable with one another and with twentieth century materials discussed here (and assuming that the Nehavand figures refer to entire village populations rather than household heads alone), the figure of 5 persons per family (household) has been used here to generate population estimates. This figure, an arbitrary compromise between the modal figure of 5.5 discussed above and the somewhat lower figures in Hasanabad and Aliabad during the 1960s, is also given as the mean household size in Malayer in 1966 (Momeni 1976:66). It may be noted parenthetically that for a sample of about 3100 Iranian villages during the period 1890–1910, Bharier (1972:59) reports a mean of 85 houses per village, and an average of 4 persons per household.

The first two columns in Table 5.5 are taken from Lambton’s account. The third column shows a population estimate for each village in her class interval, and the fourth column shows an estimated total for villages in that size interval, obtained by multiplying the number of villages reported by my estimated village population. The Malayer estimates are certainly too low, because demographic data are unavailable for 82 villages. These aggregated data would suggest that mean village population in the Malayer area was 342, compared with an estimated mean of 238 in Nehavand (median village population in Malayer would have been 375, compared with 250 in Nehavand). Even without these admittedly rough estimates, and even eliminating the 82 Malayer villages for which population figures are not available, one would conclude that Nehavand had smaller and fewer villages than Malayer. There, 38% of the population lived in villages of fewer than 125 people, and 69% lived in villages of fewer than 375. In Nehavand, 45% of the region’s population lived in villages of less than 200 (the estimated midpoint being 150), and 83% lived in villages of under 400 (with midpoint population of 350). Although the Malayer and Nehavand plains are roughly the same size as that of Kangavar, which is approximately 30,000 ha

(Veenenbos 1959:5), it is not clear how many villages were situated in the Kangavar plain at the same period. At a slightly later date, the Kangavar “district” reportedly had 45 villages (Rabino 1920:11), but no population figures are available.

Lambton’s data, as arrayed in Table 5.5, suggest that in the late nineteenth century in central western Iran two areas of roughly the same size as the Kangavar plain supported populations of differing size. These regional populations were distributed in differing numbers of rural settlements, with Nehavand (apparently) supporting fewer villages with somewhat smaller populations. Despite their differences, and variations in recording procedures, these ethnohistoric data suggest that at least some of the demographic characteristics observable in small rural settlements today existed in the preceding century; they may well have existed considerably earlier.

Focusing exclusively on small-scale rural settlements, the preceding section indicates that Southwest Asia cannot be treated as a monolithic whole, the “Middle East,” whose villages are all normatively viewed as look-alikes. Size ranges for nucleated settlements may not vary greatly from region to region, but interregional densities do appear to differ. In some areas, perhaps primarily where orchard crops are grown, and because of features peculiar to local irrigation systems, rural settlements are dispersed rather than nucleated, so that their areas are quite large and their densities correspondingly low. The data in Table 5.3 suggest that the Anatolian and Iranian plateaus may have settlement densities lower than about 100 persons per hectare, compared with densities of perhaps 100–150 per hectare in Zagros villages, and of over 150 per hectare in the southern alluvial plains of the Tigris–Euphrates drainage system. In addition, data for the Aliabad area (Tables 5.1 and 5.2, and Figure 5.3) and for other parts of Southwest Asia (Tables 5.3 and 5.4) indicate that even within any given “region” there may be variability in settlement size and density. A small nineteenth-century sample (Table 5.5) supports the argument for the existence of variability within a fairly circumscribed geographic area at the same time that it suggests time depth for the contemporary Zagros pattern. The diversity described here points up limitations in some of the generalizing operational assumptions that archaeologists must often make when developing population estimates for prehistoric settlements based, in particular, on areal data obtained in site survey.

SETTLEMENT AREA, POPULATION, AND FUNCTION

Lacking abundant empirical evidence to the contrary, many archaeologists have tended to assume that, regardless of possible differences in economic and political organization in sites of different size, there are positive linear associations between settlement area, on the one hand, and both population and func-

tion on the other. It is often assumed that larger sites had larger populations than smaller ones. Given the correlations in Table 5.4, this does not seem a grossly unreasonable assumption. However, archaeologists also often assume that bigger settlements in a regional settlement hierarchy were functionally larger than smaller sites. In other words, larger sites are also often taken to be the remains of towns or cities, rather than of villages or hamlets; this assumption is perhaps supported by geographers' findings that settlement population and settlement function are often positively correlated (Haggett 1965). In operationalizing these assumptions, archaeologists are constrained by the kinds of survey data available to them. For the most part, these consist of site areas and the distribution of objects and, sometimes, structures and features on sites' surfaces. From these they may wish to reconstruct both population and function. For empirical data and theoretical and methodological approaches to settlement patterns, archaeologists have increasingly relied on geographers. Geographers, in turn, have tended to explore relationships between settlement population size and distribution, and settlement functions, but in some cases have not provided information about areal size.

The data on regional variation in Southwest Asia reviewed above suggest that settlements of comparable (areal) size sometimes have differing population sizes, and that in addition to geographic differences in density, population density in villages within one region may vary, perhaps increasing with settlement age. Sweet (1960:48) notes that older settlements in the Aleppo area are more populous and more "compact," and the data cited from southwestern Iran suggest that this may be the case there as well. Aliabad too may have become increasingly crowded over the past decade, even as it has grown slightly larger in area, because of a preference for extended virilocal households, which results in close spatial proximity of near patrilineal kin. When extended-family compounds become too crowded, large compounds are sometimes structurally subdivided, and some open areas—gardens and village commons—have been purchased to allow the construction of new houses, resulting in in-filling as well as areal expansion at the village's margins. In the late 1970s a similar pattern was observed in Baghestan (L. Horne, personal communication). Thus, population density and settlement area may both increase with time.

Density and area may also vary with settlement function. Archaeologists working in Southwest Asia are divided on this issue. Some, like H. T. Wright (1969), have suggested that larger settlements generally have higher densities; other archaeologists (e.g., Sumner 1979) believe that because they contain more public and nonresidential areas, towns and cities tend to have lower densities than villages. In the absence of a substantial body of empirical data, most archaeologists who have addressed the question explicitly have used a single baseline estimator regardless of settlement size, while acknowledging the problems this raises (Adams and Nissen 1972; Johnson 1973). It may be useful in this

connection to consider briefly some of the similarities and differences between villages and towns that have implications for the collection and interpretation of archaeological data.

TOWNS AND CITIES

Several studies of towns and cities in western Iran have been published during the past two decades. These include a town planning study of the Kurdish capital, Sanandaj, largely a case study in “modernization” (Alten 1959), and the more geographically oriented studies of Kermanshah (Clarke and Clark 1969), Malayer (Momeni 1976), and Shiraz (Clarke 1963). Following United Nations guidelines, the Iranian government classifies these and other settlements with populations exceeding 5000 as towns or cities rather than as villages.

In addition to their smaller populations, villages also perform fewer administrative and commercial functions than towns, and display less architectural diversity. In Aliabad, a village of “average” size for its area, most structures are residential, but there are, in addition, a government school and a public bathhouse, as well as a few rooms that are attached to dwellings but function as shops. A few of the larger villages in the area have more shops (some of them, such as butcher shops, are functionally specialized; those in Aliabad are not), and some have a mosque, a shrine, a mill, and/or a post office. In contrast, urban centers not only have public baths and mosques, but also markets, banks, post offices, telephone and telegraph offices, and a range of other government buildings and services (including, for example, jails and gendarme posts). Even at the turn of this century, in district centers in Kermanshahan province, Rabino (1920:11) noted the presence of post offices and telegraph services in such small towns as Kangavar (at that time, as today, a small “district center”; with about 1800 houses it had, using Rabino’s estimator, a population of perhaps 9000). Towns also have public squares, often decorated with commemorative statues, fountains, and flower beds. These contrast markedly with the village commons, an unmodified open area in which people may stand and chat, carry out such short-term economic activities as cleaning grain or piling fuel, or herd village livestock for inoculation by visiting government veterinarians. They are functionally important areas, but contain none of the structures or “improved” surfaces like those seen in the town square. In short, towns not only have larger populations, but are also internally more differentiated, and serve more private and public functions, providing a greater range of goods and services, than villages. Watson (1979:31) provides an evocative account of the ways in which Iranian villagers depend on towns, and detailed information published by Alten (1959), Bonine (1979), Costello (1976), and English (1966) also illumi-

nates some of the functional differences between smaller and larger centers in Iran.

For their goods and services, and for the information garnered in them, towns like Kangavar and Tuyserkan provide important reference points for villagers. Like Aliabadis, most probably visit towns which are closest and easiest of access, regardless of administrative structures and relationships imposed by the central government. They also visit such small towns more often than they do the much larger provincial capitals, which are more widely spaced and therefore farther away and more expensive to reach; long trips also remove villagers from the local labor pool, and require cash outlays for transportation and subsistence. Some villagers occasionally speak disparagingly of towns and their citizens, perhaps in part because villagers are often poorly treated by town dwellers, yet some do emigrate to urban centers. For some time, villagers from surrounding areas have been settling in Kangavar, for example. One of the interesting features of this migration is that the houses in at least one quarter of the town are built in village "style," of packed and often unplastered mud rather than of the baked bricks or plastered and painted mud bricks seen in older and presumably more affluent town homes. In Kangavar, one such village quarter is adjacent to a large cemetery, an area at the edge of town not generally viewed as desirable real estate. In this town, at least, immigrants' quarters cannot be "centrally" located, because the town center was established long before they immigrated and is taken up with government offices and commercial establishments. Earlier in this century, Kangavar was a town (*petite ville*) of seven quarters, but it is not clear how they differed from one another or what they were called (Rabino 1920:11).

Another interesting aspect of this migration (which reflects, in part, villagers' expressed interest in obtaining better services, better water, and electricity) is the fact that even within an urban context, villagers are localized. Today, rural immigrants to Malayer reside in those parts of town that are nearest their villages of origin (Momeni 1976:190), and informal observations suggest that a similar pattern exists in Kangavar, although it is not clear that all former residents of a given village live in contiguous houses, and there may not yet be enough immigrants from particular outlying villages for a clear pattern to have emerged. But there is considerable evidence in contemporary cities, and in cities known from the medieval period and even from the cuneiform record, indicating that immigrants from a given tribe or outlying village, as well as members of ethnolinguistic groups (e.g., Kurds) or religious minorities (e.g., Zoroastrians, Christians, Jews), often tend to occupy the same part of the town to which they move (Clarke 1963:50; Gulick 1955:102; Lapidus 1967:51, 86; Oppenheim 1969:11f.; Ziadeh 1970). In medieval Fustat (Cairo), close kin often coresided or occupied adjacent houses (Goitein 1969:88), as appears to be the case in many modern villages and at least some cities (Gulick 1967:137f.).

Town populations today and in the past may thus be locationally organized along a number of possible lines: occupational, ethnolinguistic, religious, economic, geographic origin (Ahsan 1979:166; Fonseca 1969:109; Hemmasi 1977). Towns may also be characterized by internally differentiated densities. Sjöberg (1960:97ff.) believes that wealthier urbanites will tend to be more centrally located, but Berry *et al.* (1963) have argued that within towns the poor are likely to reside in central locations, at higher densities, whereas wealthier residents will occupy larger tracts of more peripherally located but less crowded land. Land costs are considered the main reason for this pattern, with prices assumed to be highest at town centers. The poor can ill afford transportation to centers, and allocate their incomes to real estate, on smaller tracts, rather than to transport costs. As city centers become increasingly crowded, those who can afford to move to residential suburbs do so, with a corresponding drop in the “density gradient” over time. Berry *et al.* comment on a difference between this so-called “western” pattern, and one they term “non-western,” in which densities do not decrease with time, and in which there is a lesser degree of expansion at town peripheries occupied by poorer groups (1963:401). Costello (1976:101) disputes this characterization, suggesting that the “non-western” sample of Berry *et al.* was in some respects biased. He points to his own data from Kashan, on the eastern edge of the Zagros, and notes that there appears to be no correlation between density and distance from town center. On the other hand, his Kashan data would seem to support Berry *et al.* insofar as they indicate that the more affluent townspeople live in the higher and better-watered suburban areas (Costello 1976:98f.). Nearer Kangavar, the more affluent families of Malayer have also reportedly moved away from the town center, which has come to be dominated by “lower middle class” families and rural migrants (Momeni 1976:190).⁸

That a similar pattern may have obtained in the past is suggested by some accounts of medieval Middle Eastern cities. For example, at the medieval Moroccan site of Qsar es-Seghir, house density decreased with distance from the central “civic area” (Redman and Anzalone 1980). Lapidus reports (1976:86f.) that in the fourteenth and fifteenth centuries, *emirs*, markets, and religious institutions tended to cluster in “central quarters” of urban centers, which “tended to be wealthier” (though he notes that other quarters, in general, contained both rich and poor inhabitants). But in slightly earlier Mamluk Syria, as in present-day Malayer and Kashan, wealthy suburbs developed because “the

⁸Costello (1976) also objects to Berry *et al.* on the grounds that they misunderstand the nature of residential land use, attributing it to differences in income. He says that “in the pre-industrial Middle Eastern city residential land use was divided according to ethnic, occupational and family ties, *rather than* income group [p. 102; emphasis mine].” There is no good reason to assume that these variables are completely unrelated, as his statement implies them to be, and in fact data presented in Chapters 2 and 3 suggest that in some cases they may be related. Perhaps Berry *et al.* err only in simplifying the distinction between western and non-western cities, which would seem to require further investigation, as their reference to observations by Paul Wheatley suggests they are aware.

richer people wanted to live in more pleasant parts than the inner quarters could provide them [Ziadeh 1970:82]."

One implication of the argument put forth by Berry *et al.* (1963) is that differential density within towns is associated with variation in house size. No data on this point are available for Malayer, Kashan, or Kangavar. In Shiraz, the old (center) city is much more crowded, and dwellings are reportedly smaller, than in outlying areas. New Shiraz, locationally not "central," is "middle and upper class . . . and wealthy" (Clarke 1963:21ff.). The city of Aleppo, though located in the northwest Syrian steppe and therefore perhaps more immediately relevant to a discussion of Tell Toqaan and Kufr al-Ma than to Aliabad and other Zagros villages, is worth mentioning here because it has been the subject of a suggestive architectural study. As in Shiraz, Malayer, and Kashan, the Aleppo bourgeoisie eventually left the old (center) city for the suburbs (David 1975:37). David shows that four basic house types vary not only in layout but also in size, and he suggests that both axes of variability are related to economic differences among resident households.

The smallest houses in old Aleppo, belonging to artisans and small businessmen, have an average area of 83 m². The next in size, apparently housing residents who were occupationally comparable with those in dwellings of David's "type I," average 189 m². The third type, belonging to rich merchants, is structurally more complex and also considerably larger, averaging 400 m² in area. Finally, the largest residential structures in old Aleppo have an average size of approximately 900 m² (exclusive of gardens). Although their sizes are 100–200 m², 143 m², and 205 m², respectively, the houses of three similar economic groups in Tunis reflect a comparable pattern (David 1975:20ff.). In the four Aleppo house types, the courtyard often comprises about one-third of the total floor plan, as it does in Aliabad; in Tunis, the courtyard takes up a slightly smaller proportion of the compound area. David also notes that some large houses in old Aleppo have been subdivided over time. It is likely that density increases with time in town centers partly because house lots are increasingly subdivided to accommodate additional residents. Although its focus is a Syrian city, David's study thus suggests that some of the patterns observed in Iranian villages may reflect processes at work in settlements of differing size and, perhaps, in various geographic areas.⁹

Comparable data for cities in western Iran are not readily available. However, there is a list of structures on one block in Malayer in 1931–1932 (Momeni 1976:57). These included several nonresidential structures, and a total of 11 domiciles with a combined ground-floor area of 2193 m². Details of their layouts

⁹Even farther away, densities in the market area in Zaria city (Nigeria) are higher than they are in the zone surrounding the palace. According to Schwerdtfeger (1971:63), who does not provide a complete town plan, house layouts are comparable, but smaller sizes (and higher densities) result from decreases in courtyard areas.

are not included in Momeni's account, but an average size would have been about 199 m², close to the median size of Aliabad's compounds. In contrast to these exclusively residential structures, 10 Malayer shops averaged approximately 56 m² in size, a hotel was 297 m², and two houses with attached shops had a total of 539 m², or about 270 m² each, slightly more than the sum of an "average" residence and an "average" shop. Momeni implies that two-story houses are not uncommon in Malayer (1976:66), but he provides no figures, and does not discuss variations within the region.

Alten (1959) has briefly characterized the architecture of Sanandaj, about 130 km northwest of Aliabad, but his study includes no ground plans or detailed photographs. He notes that differences in building materials and house size are related to economic variation, and also suggests that some of the town's wealthier families are comparatively large, and live in very large compounds (1959:8f.). Most houses in Sanandaj are described as "small" in area, though they may be two or three stories high; large compounds of the extremely wealthy are in the minority. Alten provides quantified data on the amount of town space allocated to various functions, indicating that about 60% of Sanandaj's 220 ha was, in 1959, taken up with living quarters (the number of houses is not indicated), and about 19% with cemeteries—marginally more than the area covered with commercial and government structures (Alten 1959:11). This differential allocation of space to structures and cemeteries indicates that population density is variable. Like Sanandaj and other towns, Shiraz has cemeteries within its borders, and internally differentiated densities. There, they have been attributed to chronological variation, with older sections being more crowded (Clarke 1963:21). Perhaps, as in some villages, population density in cities increases with age.

In their general layout and size, residential structures in cities may resemble those in surrounding villages. To judge from observations in many villages and towns, one of the differences between rural and urban houses in western Iran is in the allocation of space to storage and, in particular, to stables. With livestock and their products available for purchase in local markets, small household flocks are not a common feature of town or city life, and structures related to animals' maintenance are often absent from houses. For this reason, a two-story residential structure in an urban center is more likely to house people at ground-floor level than its counterpart in a village, where some ground-floor rooms are likely to be devoted to storage and stabling. It was suggested above that this difference might be considered in developing density estimators for archaeological "towns" as opposed to "villages." Additional empirical data would help to clarify this issue.

The foregoing indicates that though towns, like villages, exhibit architectural variability, they are also internally more complex both demographically and organizationally. Regardless of the causes of these differences, this inference would seem to have implications for archaeological sampling design, particularly

if one assumes that such differences also existed in earlier periods. Theoretically, however, the superficial archaeological remains of a small “town” and a large “village” might look similar. Even in recent times, settlement function has not necessarily been reflected solely in areal size. In medieval periods, for example, *madina* (“city”) might be used to refer not to a center’s area or population, but to its place in an administrative hierarchy: some *madinas* were smaller than some villages and towns (Lapidus 1967:70). Even though towns and villages are functionally differentiated, an archaeologist using site area as his or her only criterion for classification might remain ignorant of such functional distinctions. That the discrimination between functionally differentiated settlements of comparable (areal) size is possible on the basis of survey data alone is suggested by Johnson’s (1975) discussion of “small cone” sites. The surfaces of a few areally small sites in Khuzistan and southern Iraq have artifacts (including small wall cones) which suggest that they may have had administrative functions. Detailed analysis of types, numbers, and associations of surface artifacts on individual sites and among various sites is one way to maximize archaeological survey data. (Ideally, this approach would be complemented with excavation. Wright *et al.* [1980] describe a small [1.3 ha] site in Khuzistan that apparently served some specialized administrative functions; analysis of excavated artifacts facilitated the refinement of their hypothesis. On areal grounds alone, Tepe Sharafabad would probably not have been classified as a “center” within its larger regional setting.)

At present, many Old World archaeologists continue to evaluate prehistoric sites and suggest what their functions may have been on the basis of their locations and relative sizes. This approach is based on some of the clearer elements of contemporary settlement patterning, such as the existence of site size hierarchies. An ethnographer utilizing recent census data for Hamadan and Kermanshahan provinces might discern breaks in distribution of settlements’ populations and consider them a reflection of a size hierarchy comprising, say, five classes. He or she might term these small villages (with populations of fewer than 2000 persons; Aliabad would fall in this category), large villages (with populations of about 2000 to 5000); small centers (with populations ranging from about 5000 to about 15,000); medium centers (approximately 20,000 to 50,000), and large centers (with populations in the range of 100,000 to 300,000 and more). The largest contemporary size class comprises the provincial capitals Hamadan and Kermanshah. Kangavar and Tuyserkan would both be classified as small centers, although they have differing administrative roles and titles within the national hierarchy (see note 1). This hierarchy based on population size seems at first to be paralleled by areal data published in the gazetteer.

Table 5.6 shows 1966 populations of some of the major settlements in the area between Kermanshah and Hamadan, the two provincial capitals that bound the area considered here. It also indicates areal sizes for these large centers, as measured from maps published in the gazetteers based on the 1966 census. It

TABLE 5.6
Population Density in Selected Towns and Cities, Zagros Area^a

Settlement	Population	Area (ha)	Density	Alternate area	Alternate density	References
Kermanshah	187,930	2200	85.4	1021*	184.1*	Clarke and Clark 1969; gazetteer
Hamadan	124,167	1790	69.4	737*	168.5*	Gazetteer
Sanandaj	43,678	220	199.0	—	—	Alten 1959
Malayer	28,434	532	53.4	315*	90.3	Momeni 1976; gazetteer
Nehavand	23,922	340	70.4	(136?)	(175.9?)	Gazetteer
Qasr-i Shirin	15,904	200	79.5	(120?)	(132.5?)	Gazetteer
Sonqor	15,432	137	112.6	(82?)	(188.2?)	Gazetteer
Tuyserkan	11,954	192	62.3	93*	128.5*	Gazetteer
Bahar	11,842	280	42.3	(112?)	(105.7?)	Gazetteer
Shahabad-e Gharb	11,806	327	36.1	(196?)	(60.2?)	Gazetteer
Harsin	10,657	172	62.0	(69?)	(154.4?)	Gazetteer
Kangavar	9,414	180	52.3	71*	132.6*	Gazetteer
Sar Pol-i Zohab	7,890	133	59.3	(80?)	(98.6?)	Gazetteer
Lalajin	7,043	192	36.7	(77?)	(91.5?)	Gazetteer

^a Figures shown in this table are drawn from various publications. The Iranian data are derived largely from the 1966 census and gazetteers published by the Government of Iran (grouped here as "gazetteer"). Areal data in column 3 are based on planimeter measures of 1:200,000 maps in the gazetteers. However, there are also important alternate sources of areal data for some large settlements, all of which suggest that the figures in column 3 may be too high (and that the density figures are accordingly too low). For the most part, these other sources are maps published by the Cartographic Institute in Tehran. Data for the last seven towns refer to various time periods, but all date to the twentieth century A.D.

Because the detailed cartographic data referred to are reliable (e.g., excellent maps drawn at 1:2500) it is suggested that the gazetteer maps for large towns and cities drawn at 1:200,000 actually include substantial adjacent "sustaining areas" lacking concentrations of residential (or other) structures. Thus the alternative areal figures shown in column 5 derive from two sources. Those with asterisks are based on measures of reliable small-scale maps of individual settlements; these areal data were used to compute the alternative densities shown. The second source of alternate figures (those shown in parentheses, with an accompanying question mark) is a "correction factor" of 40%, somewhat less than the mean difference between areas on the 1:200,000 and 1:2500 maps where both are available for the same settlement (e.g., Kangavar). The asterisked figures

would seem possible to use both area and population to rank these large settlements provisionally. The group ranking highest would comprise Kermanshah and Hamadan; the second, Malayer and Nehavand.¹⁰ Below Nehavand, towns with populations of 16,000 or less form what might be construed as a continuous sequence in both population and settlement area, terminating at the 5000 figure used as the definiens of town.

¹⁰It is not assumed that size hierarchies in the "regions" surrounding these "centers" are identical; further, if the scale of analysis were shifted, the size hierarchy and composition of size classes might change. The current Iranian administrative-regional hierarchy is outlined in note 1.

TABLE 5.6 (Continued)

Settlement	Population	Area (ha)	Density	Alternate area	Alternate density	References
Asadabad	6,714	188	35.7	68*	98.7*	Gazetteer
Kabudrahang	6,494	100	64.9	(40?)	(162.4?)	Gazetteer
Sahneh	5,986	120	49.9	(48?)	(124.7?)	Gazetteer
Serkan	5,115	110	46.5	(44?)	(116.3?)	Gazetteer
Gilangharb	5,048	114	44.3	(68?)	(74.2?)	Gazetteer
Paveh	3,918	107	36.6	(64?)	(61.2?)	Gazetteer
Shiraz	200,000+	687+	291.0	—	$\bar{X} = 152$	Clarke 1963
Marv Dasht	<25,498	160	117.0	—	—	Sumner 1979; personal communication
Kerman	60,000±	800±	75±	—	—	English 1966
Kashan	58,468	401	145.8	—	—	Costello 1976
Baghdad	253,485	2479	102.2	—	—	Adams 1965
Diwaniya	33,204	195	170.3	—	—	Wright 1969
Ech-Chibayish	11,000±	(22?)	500±	—	—	Salim 1962

are probably more reliable than those based on the gazetteer alone. Dashes indicate that additional sources of areal data were not available.

Some of the settlements require comment. First, Lalajin, a pottery-manufacturing village, is unusual, being divided into residential and industrial quarters. Second, the figures shown here for Malayer are based on Momeni (1976: Figure 6); a 1 : 2500 town map suggests an area during the same period of about 374 ha, which would give it a density of about 76 persons per hectare. Third, Kangavar (in 1966) was approximately 71 ha in area, with a density as shown; an aerial photograph suggests that by 1969 it had grown to about 78 ha, but no population figure is readily available for that later date. Fourth, the 1:2500 map of Kermanshah suggests an area of about 1021 ha, with density as shown. In contrast, a planimeter measure of an illustration published by Clarke and Clark (1969) suggests that in 1965 Kermanshah had an area of 630 ha. Fifth, Clarke's map of Shiraz is incomplete (1963: Figure 5) and he indicates that in 1956 density within the city ranged from 50 to 300 persons per hectare, with an average of about 152. Finally, in Baghdad, population densities for the city as a whole averaged 102 persons per hectare, but they ranged from 34.7 to 330 per hectare, and government buildings tended to cluster in restricted parts of the city (Adams 1965: 24).

The notes in Table 5.6 indicate that where other areal data are available, they differ substantially from figures measured off the gazetteer's 1:200,000 maps. It is suggested that the settlement areas shown on these gazetteer maps actually include nonarchitectural areas (including at least a portion of immediately adjoining "sustaining area"). If this inference is correct, some of the population densities shown in Table 5.6 are too low, and the alternate figures may be more reliable. Data displayed in Table 5.6 suggest that the issue of population density in larger settlements is more complex than might have been anticipated. Although the data for western Iran are limited and somewhat problematical, they

suggest the possibility that density does not remain constant as area increases. Small towns may have densities similar to those of villages in the same area, whereas densities in large centers (such as Kermanshah and Hamadan) appear to be considerably higher. (In contrast, Berry *et al.* [1963:396] suggest that small-scale cities are more “compact” than larger cities.)

The Iranian government, which has a complex administrative hierarchy and terminology involving settlements of varying population sizes and differing functions, may sometimes ascribe terms and functions to settlements that do not meet all the criteria for such classification. Such designations may in turn be accompanied by an increase in size, reflecting the movement of people and capital to centers where they think they might “see some action” or “get some goods.” Some “centers” may thus originate as small settlements that at first are not readily distinguished areally or demographically from nearby villages. Centers may attain a certain size because they independently develop a particular group of facilities and services at governmental behest. This may be happening in the areally small settlement of Zamanabad, in the Turan area discussed above. It may also have happened in Paveh (near the Iraqi border, in Kermanshahan province), which in 1966 was classified as a town although its population was only about 4000. Locational considerations were probably involved in this case, as they were in founding Malayer in A.D. 1808 (Momeni 1976:29). Thus settlements of comparable size (demographic and/or areal) may assume differing functions because, for one reason or another, a central government treats them differently, as was the case with some medieval cities. Conversely, of course, the government may sometimes select as administrative centers those towns which have already attained a certain size.

If the most reliable alternative areal figures of Table 5.6 are used, the correlation between settlement area and population is positive and very high,¹¹ and reminiscent of those for population and area in small rural settlements and a sample of larger Iraqi settlements (Table 5.4). Adams' sample ($N = 15$; 1981:350) of medium and large settlements in south-central Iraq suggests the existence of a site size hierarchy composed of at least three classes. Arranged according to population, these data imply gaps or breaks between size classes (100–10,000; 30,000–50,000; 200,000); such gaps also appear to exist in size hierarchies in western Iran (English 1966:157, 170; Table 5.6 this volume). In Adams' sample, populations comparable to those in the Zagros towns shown in Table 5.6 in some cases occupied substantially smaller areas, which consequently had higher densities (Table 5.4). However, the population and areal data for this Iraqi sample¹² suggest that density increases with settlement area, a

¹¹Here $N = 10$, $r = .92$, $p \leq .01$. The centers used in this correlation are Kermanshah, Hamadan, Sanandaj, Malayer, Tuyserkan, Asadabad, Kashan, Baghdad, and Diwaniya.

¹²I am most grateful to Robert McC. Adams for providing me in 1979 with his then unpublished list of settlement populations and areas; he bears no responsibility for my comments, nor for any errors in the computa-

TABLE 5.7
Household Sizes and Number of Houses, Selected Zagros Towns, 1966^a

Settlement	Population	Number of households	Size of household, $\bar{X}$	Number of houses	House population, $\bar{X}$
Kermanshah	187,930	36,597	5.1	18,394	10.2
Hamadan	124,167	24,967	5.0	13,504	9.2
Malayer	28,434	5,508	5.2	3,890	7.3
Tuyserkan	11,954	2,448	4.9	1,413	8.5
Bahar	11,842	2,160	5.5	1,696	7.0
Harsin	10,657	2,038	5.2	1,148	9.3
Kangavar	9,414	1,806	5.2	1,211	7.8
Lalajin	7,043	1,350	5.2	1,031	6.8
Asadabad	6,714	1,203	5.6	735	9.1
Kabudrahang	6,494	1,298	5.0	1,111	5.8
Sahneh	5,986	1,157	5.2	877	6.8
Serkan	5,115	1,086	4.7	453	11.3

^a Data for Malayer were obtained from Momeni (1976); data for other centers were obtained from various publications of the 1966 census conducted by the government of Iran. Figures for Kermanshah, Malayer, and Kabudrahang are not included in the 8250 km² area discussed above.

pattern also suggested by a comparison of Tables 5.2 and 5.6. Settlement density may increase with functional size.

Additional data for some of the towns and cities listed in Table 5.6 are shown in Table 5.7. Based on those publications of the 1966 census that distinguish between households and houses,¹³ these data suggest that although mean household size in these larger communities compares with those in Table 5.2, houses tend to have somewhat more residents than they do in many villages in at least parts of the central Iranian Zagros. Whether or not this actually reflects greater crowding in urban residences cannot be determined from the published census data (since they do not provide information on house areas). It may be in part related to differing usage of ground-floor rooms in multiple-story dwellings, as was suggested above, and might well also reflect differences in the composition of rural and urban residential groups, with more distant kin and/or nonkin,

tions shown here. It should be noted that this sample does not represent an entire regional population; these comments, therefore, must be viewed as suggestive.

¹³According to the *National Census of Population and Housing* (Government of Iran 1968a:b-d), "a private household . . . consists of several individuals residing in one place and sharing expenses and principal meals. . . . For purposes of the census, two conditions have been observed in the household definition: (a) sharing living quarters, (b) sharing expenses and principal meals." A "housing unit," in contrast, is "an entire structure or an independent part of the structure which is the living quarters of one or more private households. Thus, by definition, the number of households is greater than the number of housing units." Not all of the publications of the 1966 census make this distinction; those that do not simply tabulate households. The apparently larger size of urban houses' populations appears to be a feature of the Kashan region as well (Costello 1976:31).

perhaps, residing with urban households (Choldin 1976:320; Laslett 1972), possibly because of the high cost of urban real estate (Berry *et al.* 1963; David 1971:127). Clarke and Clark (1969:118) report that 23% of the housing units in Kermanshah contained three or more households (generally occupying buildings of four to seven rooms); more than half of that city's households lived in single rooms.

Data reviewed here suggest that in some respects villages and larger centers are similar. For example, house size varies with economic status, and houses may be internally subdivided over time. Kin often live near one another and, in cities, immigrants from the same village apparently tend to live in the same quarter. In both villages and cities, density as well as area appear to increase with settlement age,¹⁴ and at least in some cities, wealthier residents (and larger houses) may make locational shifts as density in city centers increases. However, villages and cities differ in areal and population size and in degree of diversity (in people, activities, structures, and, presumably, associated artifacts). Villages and larger centers do not necessarily have comparable population densities, in some cases probably because urban houses have more residents. Settlement population and area may be related in a roughly linear fashion (Haggett 1965:116), but densities tend to be higher in some urban centers. In the Zagros towns shown in Table 5.6, there is some indication that fairly small towns have densities similar to or lower than those of villages in the same area (i.e., below about 100 persons per hectare), whereas such large settlements as the provincial capitals have densities exceeding those of most villages. The extent to which this "pattern" may characterize other parts of Southwest Asia remains to be established. Even if it were real, and widespread, one might argue that viewed from a regional scale intersite variability would average out, such that overall population estimates would not be seriously affected. However, although it may be true that archaeologists' demographic reconstructions are often coarse-grained, and that archaeologists are often more concerned with monitoring relative change over time, such an argument might trivialize interregional variations as well as differences among sites articulated on a regional level (Kramer 1980:316).

Intraregional variation in density—small towns (perhaps) being about as crowded as villages, and large towns (perhaps) having differentiated densities but overall being more crowded than both—might relate both to relative ages of settlements and to differences in real estate costs, as well as to changing patterns of rural–urban migration (Bharier 1972) and a host of other factors. A newly designated center (like Malayer in 1808) might quickly attract an immigrant population (as it apparently did), but because the government defines it as a

¹⁴Although Oates and Oates (1976a:120) do not document their statement, presumably based on their wide experience with both contemporary and archaeological villages in Southwest Asia, they have described the process, or part of it, succinctly: "Density of population is a variable factor but . . . as settlements increase in size, houses tend to be constructed closer together and less land within the settlement area lies unoccupied."

center, there may, from its earliest stages, be “public” spaces and nonresidential structures within the city’s boundaries that have the effect of limiting the rate and uniformity of increases in density. Some ancient and many medieval cities were areally comparable with those shown in Table 5.6 (Lapidus 1967; Oppenheim 1969; Russell 1972). They too had open areas and large administrative and religious buildings, and it is likely that, like modern cities, they were characterized by internally differentiated densities. Because they have implications for the study of ancient settlements and settlement systems, the relationships among area, population, function, density, and age merit further investigation. So too do relationships between settlements and their productive environments.

SUSTAINING AREA

Chapters 2 and 3 indicate that in the area considered here, annual per capita grain consumption ranges from about 100 to about 250 kg and consists primarily of wheat.¹⁵ With a total hectareage of 43 *juft* (approximately 300 ha, in this area) available to them, the people of Aliabad plant in a pattern of alternate-year fallowing with little “surplus” and no cash-cropping; they appear to subsist on about .7 ha per person per annum.¹⁶ The production and consumption figures discussed in Chapter 3 do not take into account the reservation of seed grain. If in an “average” year in Aliabad productivity is within the range shown in Table 2.3, as much as 150 kg of a hectare’s annual yield of 550 kg of wheat might be reserved as seed grain; in such a hypothetical case, 400 kg/ha would be available for consumption, sale, or storage for future lean periods, or for such community events as funerals, weddings, and religious feasts, when contributions of bread are made by most households. If, in the “average” household, each person consumed the very modest quantity of 160 kg/year, 1 ha of their holdings would feed only 2.5 household members, each supported by .4 ha/year. If, of the theoretical 550 kg/ha none was reserved for the next year’s planting, the single hectare would support 3.4 people, each on .3 ha/year.

The blanket use of such estimators of sustaining area might mask some interesting variability. As the description of Aliabad indicates, not all years are average, and not all households own land. The example just given assumes that all villagers are equal consumers, whereas food consumption definitely varies

¹⁵Data published by Watson (1979:68) indicate that in Hasanabad, roughly 85 km southwest of Aliabad, average per capita wheat consumption is closer to 250 kg. The present discussion assumes a fairly “traditional” subsistence system, much like that of Hasanabad, whose technology and economy have been described in considerable detail by Watson (1979). Her fieldwork antedated the 1960s land reforms, and although none of Hasanabad’s farmers were independent landowners, she documents differential landholding among them.

¹⁶See pages 65ff., this volume. It is quite likely that with a combination of increased irrigation, greater use of chemical fertilizers, and increased reliance on high-yielding varieties of wheat, output could be increased for at least a few years, if not necessarily on an indefinite basis.

with age, probably with sex and, very likely, with economic status as well (DeWalt and Pelto 1977; DeWalt *et al.* 1980; Rosenberg 1980; Watson 1979:68). Both consumption and production also vary interregionally, and levels of productivity vary with technological input and a host of other factors. Table 2.3 reflects regional variations in wheat consumption. In southern Iraq, with somewhat different land use practices, average annual per capita wheat consumption is comparatively low, and in contrast with the Zagros, large quantities of barley, rice, and dates are eaten. Finally, archaeological assumptions about food production sometimes ignore the possibility that arable land within settlements was cultivated. In Aliabad, household gardens provide fruits and vegetables, as well as fodder, and medieval as well as ancient cities often enclosed agricultural areas (see Lapidus 1967:64). However, it seems unlikely that large-scale production of staple cereals and legumes has ever occurred within nucleated settlements like those so characteristic of much of the Middle East, particularly in view of the

TABLE 5.8
Sustaining Area of Small Settlements, Aliabad Area^a

Village ^b	Population	Number of households	Hectarage	Hectares per person	Hectares per household
1	1806	305	790	.44	2.59
2	1448	272	960	.66	3.53
3	782	150	926	1.18	6.17
4	724	110	345	.48	3.14
5	688	136	597	.87	4.39
6	515	105	229	.44	2.18
7	506	79	529	1.04	6.70
8	501	82	130	.26	1.59
9	458	75	305	.66	4.06
10	451	93	421	.93	4.53
11	437	89	1400	3.20	15.77
12	426	81	180	.42	2.22
13	403	87	1002.5	2.49	11.52
14	392	75	832	2.12	11.09
15	356	66	94	.26	1.42

(continued)

^a These figures are drawn from the 1966 census (Government of Iran 1970a, 1970b). The census figures for a few of these settlements include "wasteland, noncultivated land," and/or "natural pasture"; most do not. Some of these figures include "orchards." There are occasional inconsistencies and omissions in the census and gazetteer tabulations: for example, Aliabad is not listed as having orchards, although a few of its gardens are devoted solely to trees; also, although it is listed as having no irrigated wheat, the total number of hectares tabulated in the census is correct. Figures in the gazetteer (and here) are in hectares, not *juft*.

^b Aliabad village is included in this list but omitted from computations for the region discussed in the text.

probability that annual per capita cereal consumption in the past also fell somewhere in the range of 150 to 250 kg, not only in the Zagros but in other regions as well.

Despite their similarities, villages in the same region may, for a variety of historical reasons, have different-sized landholdings. Table 5.8 lists figures for holdings in the 41 villages shown in Table 5.2; data for all of these settlements are given as tabulated in the 1966 census. Since 40 of them are in the immediate vicinity of Aliabad, it is assumed that, by then, all had been affected by the land reform laws of immediately preceding years. From this it would follow that, given the freeze on land sales, these villages had in 1975 about the same hectarage as they did during the 1966 census. Nonetheless, in at least the case of Aliabad, it is clear that the gazetteer listing for hectarage is limited to the 32 *juft* in the immediate vicinity (*mulk*) of the village; the additional 11 *juft* controlled by some Aliabadis are not indicated in the census. If the same discrepancy exists for any of the other

TABLE 5.8 (Continued)

Village ^b	Population	Number of households	Hectarage	Hectares per person	Hectares per household
16	325	72	195	.60	2.70
17	322	61	336	1.04	5.51
18	300	60	158	.53	2.63
19	296	63	1283	4.33	20.37
20	261	53	654	1.51	12.34
21	260	57	390	1.50	6.84
22	242	38	476	1.97	12.53
23	201	41	148	.74	3.61
24	195	43	351	1.80	8.16
25	187	32	522.5	1.22	16.33
26	169	30	62	.23	2.07
27	145	32	194	1.34	6.06
28	132	23	356.5	2.70	15.50
29	124	24	242	1.95	10.08
30	121	22	135	1.12	6.14
31	121	23	170	1.40	7.39
32	115	19	228	1.98	12.00
33	113	18	52+	.46+	2.90+
34	112	54	65	.58	1.20
35	112	22	112	1.00	5.09
36	86	11	266	3.10	24.18
37	82	17	253	3.10	14.88
38	78	16	191	2.45	11.94
39	62	14	135	2.17	9.64
40	38	5	127	3.34	25.40
41	69	13	96	1.39	7.38

40 villages shown in Table 5.8, some of the hectareage figures for individual villages are too low, and others are probably correspondingly inflated. However, despite adjustments for individual settlements, the total regional figures are probably fairly reliable. Even if Aliabad's 32 *juft* alone had fed its 1966 population, mean hectareage at that time would have been almost .7 ha per capita.

In at least one case (village 33) shown in Table 5.8, the census indicates explicitly that additional landholdings were not tabulated. In another (village 36), the hectareage figure is probably unusually high because the settlement is the single village that a former landlord was allowed to keep after land reform; variations in other villages' hectareage may reflect differences in villages' economic statuses at the time land reforms were implemented in this area, with some villages having more people able to buy (more) land. Some villages (e.g., village 14) are among those described by Aliabadis as being "rich" in land and thus being able to practice a 3-year, rather than alternate-year, fallowing cycle, and this rotation schedule may be used in some of the other villages averaging more than 1 ha per person. Unfortunately, information on the composition and variability of local soils, fallowing strategies, cropping practices, and allocation of surpluses in this region is scanty. The figures shown in the column "hectares per person" may mask intraregional variability in qualitative aspects of resources, and/or they may reflect variations in actual production. Presumably, such variations would relate at least in part to local differences in the mix of plants cultivated, and in soil quality, topography, slope, and the extent to which irrigation, chemical fertilizers, and mechanical equipment are used.

Despite the foregoing qualifications and the questions that they raise, Table 5.8 suggests an interesting pattern. Mean hectareage per person in 40 villages surrounding Aliabad is 1.14 (median = 1.20); mean hectareage per household is 8.3 ha (median = 6.15). Assuming household sizes of about six and an alternate-year fallowing cycle, ignoring the planting of some hectareage to fodder and/or cash crops, and disregarding seed grain, lean years, and loss of grains through processing and to vermin and mildew, these figures suggest that about .5 ha of land in this area will sustain one individual.¹⁷ Census data for 80 of the villages in the area shown in Figure 5.1 and for a much larger area (8250 km²) extending west to Kermanshah and east to Hamadan suggest that the pattern of hectareage "requirements" emerging from Table 5.8 obtains on a much larger regional scale as well, and might even be used to argue for a sustaining area somewhat smaller than .5 ha per person per year.¹⁸ Higher per capita figures in

¹⁷For this sample of 40 settlements, there are moderate positive correlations between village population and hectareage ($r = .50$) and between village area and hectareage ($r = .45$), both significant at the .01 level.

¹⁸The approximately 1040 km² area surrounding Aliabad produces a comparable figure. Data on 80 of the 96 villages in this area indicate that their combined population (41,013) controls a total of 38,108 ha or a mean of .93 ha per person (median = 1.04 ha). Dividing these figures by 2, to account for an alternate-year fallowing cycle,

TABLE 5.9
Landholdings in the Nehavand Area, 1880–1881^a

Number of villages	Number of <i>zouj</i> per village ^b	Estimated number of <i>zouj</i> per village, $\bar{X}$	Estimated number of <i>zouj</i> in class interval
5	<5	3.0	15.0
9	5–10	7.5	67.5
20	10–15	12.5	250.0
12	14–20	17.0	204.0
17	20–30	25.0	425.0
14	30–40	35.0	490.0
7	40–50	45.0	315.0
5	50–75	62.5	312.5
1	100–150	125.0	125.0
1	150–200	175.0	175.0
91			2379.0

^a Data from Lambton (1953:156).

^b The class intervals are those of Lambton. Figures in the third column are the midpoints of those in the second, and the fourth column is the product of the third multiplied by the first.

other regions (such as the Dez River pilot area) need not reflect poorer land; they may instead pertain to differing relationships between rural and urban economic subsystems.

Comparative data from elsewhere in Southwest Asia are shown in Table 2.3; sustaining area has also been discussed by Adams and Nissen (1972), Braidwood and Reed (1957), and Poyck (1962), and Lambton (1953) provides nineteenth-

implies a sustaining area of about .5 ha per person, but does not take other variables into account (such as the support of at least part of Kangavar's population).

Extending the sample further, a total population of 502,995 occupies the 8250 km² area between Kermanshah and Hamadan referred to above. This population includes a small group ($N = 64$) whose income is derived (apparently) from the operation of tea houses, and it also includes the large urban population (192,892), not all engaged in activities related to food production. The figure does not account for an unknown but small number of residents of 18 settlements recorded in the gazetteer as controlling a total of about 2784 ha; these are for the most part farmsteads or other small settlements classified in the census not as villages but as "dependent places" or independent farms. This "region" of about 8250 km² has a population which is approximately two-thirds rural. The raw figures allow for no more than 1.6 ha of land per person, if all land and all members of the population are included in the calculation. However, not all of the surface area of this region is farmed, and settlement areas have not been subtracted from the gross areal figure. If, for operational purposes, we ignore the urban population's essential nonparticipation in food production, and the dependence of that population, in varying degree, on imports, the gazetteer data strongly suggest that total (average) land allocations per person ("sustaining area") would be substantially less than 1.6 ha. Dividing this figure in half to allow for an alternate-year fallowing system produces the hypothetical and obviously too high figure of .8 ha per capita per annum for the entire area. This exercise provides a rough but illuminating upper figure for land needs for subsistence in this part of the central Zagros.

century figures for the geographically closer area of Nehavand. During the 1880s in the Nehavand–Khazal area southeast of Aliabad, the unit of farm land was the *zouj*: functionally, the *zouj* was like the *juft*. As Lambton indicates (1953:4f., 156), it is not a metric unit per se, although like the *juft* it has metric values that vary with locality. Table 5.9 incorporates figures provided by Lambton, who does not specify which of the villages in this group correspond to those referred to in an immediately preceding discussion of village sizes in the same region at the same period (1880–1881).¹⁹ In her treatment of the data displayed here, Lambton indicates that the mean number of people per *zouj* was 9.9, but states that the distribution of *zouj* was uneven (no median figure is given). Thirty-seven villages had an average of fewer than 10 “peasants” per *zouj*; at the other end of the range, 36 supported between 10 and 50 persons per *zouj*, and 4 averaged more than 20 persons per *zouj*.

The rather rough figures of Table 5.9 suggest that with a total estimated 2379 *zouj* distributed among 91 villages, mean village holding would have been 26 *zouj*. Using the estimated mean village population figure discussed above (Table 5.5), the figures suggest an average of 9.2 persons per *zouj* per village; if the figure 250 per village is used, there would have been 9.6 people per *zouj*. Neither of these estimates is far from Lambton’s figure of 9.9 persons per *zouj*. If, during the 1880s, the mean metric value of a *zouj* in Nehavand was as little as 1 ha, holdings per person would have been about .11 ha; if a *zouj* was as much as 10 ha, sustaining area could have been as much as 1 ha per person per year. However, as in the 41 villages shown in Table 5.8, variability obviously existed even within the Nehavand area; Lambton accordingly indicates that some villages were supported by less land than others. Topographically, the Nehavand area appears perhaps slightly more hilly but generally comparable with that surrounding Kangavar. Establishing the extent to which this gross similarity extends to its soils and to its nineteenth-century land use patterns would be a matter for future research. With *jufts* in Aliabad and Hosseinabad having values of approximately 6 or 7 ha, a higher rather than lower figure for the Nehavand *zouj* might be in order. In this case, the range of likely Nehavand values, and the number of people sustained by 1 ha of arable land, would probably have been quite close to those of the Kangavar area today.

For the Iraqi Zagros, somewhat to the north and west of Nehavand and Aliabad, descriptions of aspects of contemporary land use in individual (Kurdish) settlements have been provided by Barth (1953), Galloway (1958), and Leach (1940). Braidwood and Reed (1957) utilize cartographic data, rather than landholdings of individual villages, in a consideration of prehistoric occupation in the same area. The Chemchemal area which they discuss has a total population of 10,125 distributed in 64 villages, or a mean village population of 158; an estimated mean

¹⁹In that discussion, Lambton provides data for 78 settlements; here, she gives a total of 91. The reasons for the discrepancy are not clear.

distance between villages of 2.38 miles (3.8 km) suggests a slightly greater dispersal of settlements than exists in the Aliabad area today. Braidwood and Reed reason that with a density of 27.7 persons per mile (predicated on an area of 5.66 square miles available to each village), each person would have been supported by a maximum of 22.8 acres (9.23 ha). Combining the Chemchemical data with gazetteer information for two neighboring districts, these authors found that an area of 943.7 square miles (with a population of 25,842) provided, at most, 23.4 acres (9.47 ha) of sustaining area per person. However, "due to soil-stripping and gulying, only a small part of the 22.8 acres is farmed" in parts of Chemchemical (Braidwood and Reed 1957:27). The figure of 9.47 ha per person is therefore a hypothetical ceiling, surely far in excess of the actual area required to support an individual for 1 year, or even 2, in that area.

Substantially less land is required for the subsistence of one person in the lower-lying, apparently more fertile Hilla-Diwaniya area of Iraq. Poyck (1962) provides information on landholdings, which vary within six subregions in the area he discusses. Based on Poyck's data, Tables 5.10 and 5.11 indicate that the combined population (100,673) supported by the total farmland (153,650 ha) is maintained on an average holding of 1.5 ha per person, although the range is from .2 to 2.8 ha. Dividing the total surface area of the six subregions (307,673 ha) by the total population of course produces a larger "sustaining area" (on average, 3.1 ha per person). This is about one-third the maximal possible holding (approximately 9 ha) in Chemchemical, and almost double that of the region surrounding Kangavar (about 1.6 ha). The literature would seem to suggest that considerable variability can exist over fairly short distances.

TABLE 5.10
Sustaining Area in the Hilla-Diwaniya Region^a

Region	Population	Farmland (ha)	Holding size, $\bar{X}$ (ha)	Family members per holding, $\bar{X}$	Hectares per person, ^b $\bar{X}$
1	24,520	68,575	16.50	5.9	2.8
2	21,587	44,700	13.25	6.4	2.1
3	18,546	22,150	8.00	6.7	1.2
4	7,158	9,550	8.00	6.0	1.3
5	14,308	2,450	1.25	7.3	.2
6	14,554	6,225	3.25	7.6	.4
	100,673	153,650			

^a Figures from Poyck (1962:35).

^b Poyck's data are in *meshara*; 1 *meshara* = 2500 m², or one-fourth of a hectare. Mean hectare per person was computed by dividing column 4 by column 5.

TABLE 5.11
Family Size and Farm Size, Hilla-Diwaniya Region^a

Family size	Region 1		Region 3	
	Farm size, $\bar{X}$ (ha)	Hectares per person, $\bar{X}$	Farm size, $\bar{X}$ (ha)	Hectares per person, $\bar{X}$
2	10.75	5.38	5.00	2.50
3	11.50	3.83	2.75	.92
4	12.25	3.06	4.75	1.19
5	14.50	2.90	5.00	1.00
6	16.75	2.79	6.25	1.04
7	18.00	2.57	9.25	1.32
8	19.25	2.41	9.75	1.22
9	19.50	2.17	11.00	1.22
10	20.50	2.05	14.25	1.42
11	23.50	2.14	20.50	1.86
12	25.00	2.08	22.00	1.83

^a Data based on Poyck (1962:75). For the two subregions tabulated, it is assumed that farm sizes represent mean rather than median figures.

There are interesting variations even within Poyck's Hilla-Diwaniya "region" (Table 5.11). In general, larger households appear to be associated with larger farms (Ajami 1969), but there are subregional differences in average farm size and therefore in individual landholdings. The families in Poyck's Region 1 are tenant farmers; those in Region 3, with smaller holdings, cultivate their own land. Although details of usufruct and ownership in Region 3 can be complicated, these farmers do not need "extra" land to produce rent in kind, as do those of Region 1, who are required to pay up to two-thirds of the total crop to the landowner (Poyck 1962:55). Nonetheless, with a mean family size of 5.9 and a mean farm size of 16.5 ha, tenants are said to "enjoy a better standard of living" than the farm owners, who have a mean family size of 6.7 and farms averaging 8 ha (Poyck 1962:75). This is attributed to the fact that "due to the low grain return and the subsistence basis," tenants must sow large areas with grain; they are thereby "enabled to dispose of much larger areas of fallow." Farm owners, tilling less land with a higher "rotation factor," have less land at their disposal for grazing. Tenants sell cash crops and little grain, and enjoy higher levels of animal production; landowners sell grain for cash, support fewer livestock, and eat fewer dairy products (Poyck 1962:75, Table 4.13). The "standard of living" as calculated by Poyck is based partly on daily caloric intake, but also on net farm income and a number of other factors. Despite the fact that they do not own their own land, the tenants of his Region 1 might be construed, on the basis of Poyck's presentation, as having "high" socioeconomic rank relative to landowners in

Region 3. However, although tenants of Region 1 consume marginally more calories per capita per year, they also eat substantially more barley, and less wheat and rice, as well as less animal flesh, than the farm owners of Region 3 (Poyck 1962:68). Although they are complex, the Hilla-Diwaniya data may thus support the hypothesis that food consumption varies along economic lines. In this region, economic status is not reflected purely in mean farm size, but also in legal status which, in turn, is related to size of landholdings and hence patterns of land use. Unfortunately, this study provides no details of variation in material culture.

In contrast, a public health study across the Iranian border provides information both on sustaining areas of 55 villages in Khuzistan's Dez River pilot area, and on material culture (Gremliza 1962). In this study, the rural population surveyed averaged 1.9 ha per person: 11,585 people used an area of 22,311 ha, with a mean of 405.7 ha per village (Gremliza 1962:39). In a restudy of the same villages after the implementation of land reforms, Gremliza recorded a slightly larger population with only marginally more land, and a mean of 1.7 ha per person: 13,500 people used 22,711 ha, with a mean of 412.9 ha per village (Gremliza 1967-1968:19). Twenty-eight of the 55 villages surveyed by Gremliza have again been restudied, and aspects of land use in northern Khuzistan have also been described by Ehlers (1975) and Goodell (1975).

An unpublished 1971 study of the Dez River pilot area indicates that the people of 28 villages average 1.4 ha of farmland each; village sustaining areas are smaller than those tabulated by Gremliza.²⁰ This study is rare in providing metric data for the *juft*, which in Khuzistan varies from 7.3 to 20.9 ha (with a mean value of 13.5 ha, close to the figure given by Rouholamini [1973], who indicates that 12.5 ha is the size of a *juft* in the Khuzistan village he describes). It also suggests that in Khuzistan the *juft* tends to be larger than its central Zagros counterpart, perhaps because this area is topographically less rugged, permitting a team of oxen to cover a larger area in the same amount of time.

The data published by Poyck (1962) and Gremliza (1962) have been discussed at some length by Adams (Adams and Nissen 1972:28), who has used them in two widely read and extremely influential studies to argue for a figure of 1.5 ha of sustaining area per person in Mesopotamia. Excluding the city of Baghdad, he points out that a population of nearly half a million in the Diyala region of eastern Iraq is supported by an average of 1.4 ha per person (Adams 1965:23ff.). As Adams has noted, the figures 1.4 or 1.5 ha include both fallow and uncultivable land; he therefore assumes that in this part of Iraq somewhat less than .7 ha

²⁰I am indebted to former staff members of the Development and Resources Corporation (New York City) for allowing me, in 1975, to see some of the tabular data in an unpublished report entitled "Credit Requirements for Improved Traditional Agriculture. Dez Irrigation Project, 1971." The aggregate population of 28 villages (5753) utilized 8114 ha of farmland (of a total area of 8785 ha). Mean holdings of farmland per village were 289.8 ha, with 1.4 ha of farmland (and 1.5 ha of total land) per person.

per capita is sown each year. This figure is close to those reconstructed above for other areas.

CARRYING CAPACITY

“Carrying capacity” refers to “maximum sustainable density” (Odum 1975:124; see also Emmel 1973:178). The concept is often discussed in the context of demographic analyses, and assumes that there are environmental constraints limiting population sizes. Several studies (e.g., Hall 1966; Wynne-Edwards 1962) suggest that animal populations are often maintained at levels and at densities below those that their environments might, theoretically, support, but it has also been argued that technology and other features peculiar to human societies permit them to grow beyond levels which one might assume to be density-dependent (Boserup 1965; Cohen 1977; Spooner 1972). These and other discussions of carrying capacity reflect the recognition that demographic transformations have been intricately bound up with sociocultural changes. In varying degree, they also recognize that environments and technologies change, and that those of the past are not as readily reconstructed, measured, or compared, as are those of the present.

The concept of carrying capacity has been the focus of considerable discussion, much of which suggests that it is so problematical as to be of questionable value (Bayliss-Smith 1978; Hassan 1975; Hayden 1975). Carrying capacity implies maximum productivity, but as the term is often used in connection with human groups, it fails to account for temporal variation in the availability and productivity of resources, the possibility of cash-cropping or of other specialized productive activities, or the various effects that centralization in economic, political, and social institutions may have on the production, distribution, and consumption of food resources. Despite these difficulties, data on sustaining area, if applied cautiously, may be used for limited purposes (such as the comparison of two or more cultural phases within one region), and compared with such data sources as cuneiform or other written records describing food production in the same or in an ecologically and technologically similar region (Mackawa 1974; el-Sammaraie 1972; Zaccagnini 1975). Some archaeological population estimates have been based on the analysis of excavated food residues and of storage facilities, and even on the number and volume of food-storage and serving vessels (Cook 1972; Hassan 1978; Turner and Lofgren 1966; Wheat 1972). They may also incorporate assumptions regarding nutritional requirements, land use practices, and potential regional productivity (Kowalewski 1980).

Unfortunately, discussions of productivity do not always include detailed ecological, economic, and technological information that might permit a more thorough analysis of similarities and differences within the Zagros area; the present study is no exception. Even where detailed information is available, no

“magic numbers” for carrying capacity emerge. The publications cited can be lauded for their documentation of variability as well as for any patterning they may imply. Nonetheless, the data reviewed here suggest that, on average, well under 1 ha of arable land is needed for one person’s subsistence in a year and that in some cases perhaps as little as one-third of a hectare will suffice. In most of the regions discussed above, it appears that (given present patterns of food production and consumption) 1 ha can produce considerably more wheat than is needed to sustain one adult. This inference seems particularly plausible in view of the fact that in the absence of relevant data, the foregoing review has necessarily disregarded the partial dependence of urban populations on local rural farmers and their villages’ hectarage (but see note 18).

Data on contemporary sustaining areas may be used to generate a range of possible prehistoric population estimates for sites and regions, and they may also be used to evaluate the proposition that in some circumstances “surplus” was produced by villages to support administrative centers (Johnson n.d.). Site catchment analysis is one of the better known approaches to prehistoric land use. It is oriented to the individual site and heavily dependent on maximizing assumptions, but can be used as a tool in comparisons made on either a synchronic or diachronic level. It may be used to develop population estimates and, perhaps more usefully, to “test” such estimates based on other data sources (Brumfiel 1976; Findlow and Ericson 1980; Flannery 1976a:93). Archaeologists espousing an explicitly regional approach can also utilize Thiessen polygons to delineate presumed sustaining areas of contemporaneous sites and then generate population estimates. In constructing Thiessen polygons, the assumption is made that the sustaining areas of two neighboring settlements, or sites, surrounded them and abutted one another (see Chapter 6). The distances between pairs of neighboring sites are also used to compute the nearest-neighbor statistic, which has been used to determine whether settlements are distributed nonrandomly. Nonrandom distributions are either regular or clustered; the nearest-neighbor statistic has been used both to develop and evaluate theoretical locational models. The work of Earle (1976) and others suggests that this approach can be useful in analyzing archaeological data on a regional scale, although it has limitations (Pinder *et al.* 1979). In addition to their application in nearest-neighbor analysis, linear distances between pairs of sites can also be used to evaluate “gravity models,” sometimes used by archaeologists interested in interaction on a regional level (Hodder and Orton 1976:187ff.; Johnson 1977:481ff.; Plog 1976).

INTERSETTLEMENT INTERACTION

Several studies have investigated prehistoric social interaction by analyzing stylistic similarities among artifacts. This has been attempted both by using a

longitudinal sample from a single site (Deetz 1965) and by using material from a number of contemporaneous sites (Hill 1970a; Plog 1976; Whallon 1968). Such studies have focused almost exclusively on ceramics, although the attributes selected for analysis vary.²¹ The measurement of stylistic similarity (or diversity) is extremely problematical, as is its explication (Plog 1980). A number of these analyses have focused on elements of prehistoric social organization, particularly on residence and descent principles as they may be reconstructed through the identification of localized kin groups. They cite ethnohistoric and ethnographic works that are taken to support archaeological inferences about group organization and composition and presumed relationships among artisans' sex, learning of craft skills, and pottery manufacture. Each of these archaeological studies has merits as well as flaws (Dumond 1977), but one assumption that underlies them all is that close stylistic similarity reflects a high degree of interaction. Arguing that this assumption had not been satisfactorily supported, Plog (1976) has investigated intensity of interaction among several archaeological sites by using ceramic design analysis and predictions based on a gravity model. His analysis therefore assumes that inter-settlement interaction will tend to vary with distance, and in some of his data sets it apparently does. However, he concludes that "one cannot simply calculate a similarity coefficient, using design frequencies at two sites, and assume the coefficient measures the intensity of interaction between the sites" (Plog 1976:270).

Plog asserts (1976:257) that gravity models have been shown to have high predictive value in the present and argues that if, with modern systems of transportation, distance "has a dampening effect on interaction," this should have been all the more so in the past, when much travel was by foot. However, in this earlier study and a later one (1980), Plog discusses some of the problems inherent in gravity models. Among these are differential interaction intensities resulting from topographic irregularities, the possibility of skewed distributions related to specialized ceramic production and intersite interaction along purely commercial lines, and the apparent existence of a "plateau effect." He notes that several studies suggest that within a limited area surrounding a given community differential distance seems to have no effect on intensity of interaction with other communities. Gravity models, therefore, do not apply to such plateau areas; this apparent immunity to the dampening effects of distance on interaction is referred to as the plateau effect. Several publications suggest that the plateau effect "occurs primarily within distances less than 5 miles" (Plog 1976:257), or about 8 km. Within areas with such a radius, the "distance decay" characterizing interactions occurring over a larger area would not exist. This would suggest that if two

²¹William A. Longacre, one of the pioneers in this area, has completed an ethnoarchaeological study of Kalinga potters in the Philippines (Longacre 1981), where he collected data on patterns of learning and manufacture. His work should help to clarify a number of problems in the literature critiqued by Dumond (1977) and Allen and Richardson (1971).

settlements of comparable size were both within 8 km of, but not equidistant from, a third settlement, differential interaction between it and each of them would not be simply a function of differential distances. Several of the studies that Plog cites deal with locations of spouses' premarital residences. They indicate that there is an inverse relationship between "the frequency of marriage between individuals and the distance between their homes"; even in contemporary mass-transit North America, these studies of marriage patterns would seem to support a gravity model, suggesting that many do indeed marry the boy or girl "next door."

Data on marriages in Aliabad appear to support at least some of the premises of gravity models. It has been noted that the preferred pattern of postmarital residence is virilocal; agnatically related nuclear families often coreside. Villagers' stated preference is for mates of local origin, and for continued residence in Aliabad. A sample of marriages indicates that on marrying, Aliabad sons generally remain within the village, whereas daughters tend to marry out if there is no suitable local spouse. Table 5.12 lists those marriages in households for which at least two generations of residential data could be obtained in my 1975 census; all of the marital links discussed here are those of individuals born in Aliabad. For reasons outlined in Chapters 2 and 3, many of the parents of such individuals were born in other villages; their children's marriages are excluded in this tabulation. Table 5.12 is based on a sample of 46 sons and 56 daughters. Of these 102 individuals, 22 formed 11 marital alliances and remained in Aliabad. Thirty-five of the remaining 80 individuals are males, only one of whom married out of the village. Twenty-two of the remaining 34 men married immigrants, and 12 married Aliabad women not in the sample of 102. Because the focus here is on intersettlement interaction, Table 5.12 shows only those individuals in the sample of 102 who either moved out of or married an immigrant to Aliabad; it lists only 55 marriages. The single emigrating man and the 22 immigrating women cited above, therefore, are included. Of the 45 Aliabad women who did not marry men in the cohort of 102, 25 emigrated to other settlements, 13 married Aliabad men not in this cohort, and 7 married immigrants. Of this group, Table 5.12 includes only the 25 emigrating Aliabad women and their 7 immigrant husbands. (Two of the women who married immigrants remained in Aliabad for several years thereafter, and later moved to Kangavar and Tehran; these moves are not indicated in Table 5.12, although the marriages are.)

The foregoing indicates that of a total of 102 people, 47 married fellow Aliabadis and remained in the village; this 46% of the sample reflects the village preference for endogamy. Although this is perhaps not a strikingly high degree of endogamy, it has a strong virilocal cast: the majority of emigrants are women (43% of daughters), and more women than men marry in. A comparable pattern appears to obtain in Hasanabad, nearer Kermanshah. Of 36 wives in Watson's census (1979:56), 20 (56%) are native Hasanabadis; 16 others come from 12 other settlements, whose distance from Hasanabad is not clear.

Table 5.12 reflects intersettlement interaction in the form of marital alliances between Aliabadis and residents of Kangavar, Kermanshah, Tehran, 14 known villages, and a handful of unidentified communities. The majority of the 55 intersettlement marriages involve straight-line distances between any two of them of less than 20 km, with a mean distance of 8.7 km (median = 6.9). Thirty-four (62%) of the marriages shown here are between Aliabadis and natives of villages even closer than the median distance. These marriages, with villagers native to settlements of ranks 1 through 8, involve alliances within an area having a radius of 7.2 km, or about 163 km².

It is very likely that in the tabulated cases involving Kangavar, Kermanshah, and Tehran, residential shifts actually occurred several years after an initial period of residence in Aliabad (as in the two cases noted above). In no case was a spouse brought into Aliabad from an urban center; the general sentiment regarding urban women is that they are unfamiliar with village ways. This is not

TABLE 5.12
Settlement Distances and Marriage Frequencies, Allabad and Other Settlements^a

Settlement rank in distance	Straight-line distance (km)	Number of spouses originally from this settlement	Number of Aliabadis married into this settlement	Total number of marriages	Comment
1	2.8	7	4	11	
2	3.8	2	1	3	
3	4.0	2	2	4	
4	4.2	2	3	5	
5	6.0	1	—	1	
6	6.4	1	4	5	
7	6.6	2	—	2	
8	7.2	—	3	3	
9	8.0	1	—	1	
10	9.8	2	—	2	
11	13.6	1	—	1	
12	15.0	1	—	1	Kangavar
13	15.0	—	1	1	
14	15.8	1	—	1	
15	18.8	—	1	1	
16	93.0	—	3	3	Kermanshah
17	330.0	—	3	3	Tehran
n.a.	n.a.	6	1	7	Number of settlements unknown

^a Of 29 in-marrying spouses, 22 are female, 7 male; of out-marrying individuals, 25 are female and 1 male. Aliabad's nearest neighbors to its east and south are about 4 km away; those to its north and west, approximately 2.5 km. Mean distance between nearest neighbors in a larger regional context is 1.7 km. The abbreviation n.a. indicates that data are not available. A dash indicates that in this sample there are no marriages involving this settlement.

seen as automatically stigmatizing Kangavar girls, some of whom are daughters of villagers who had emigrated there in their middle years. Urban men, like women, are unlikely to immigrate to rural settlements: at least at present, they are not in a position to acquire land, and could sustain themselves only if given access to an affine's productive resources.

It is probable that many of the marriages between Aliabadis and members of the more distant communities shown in Table 5.12 were arranged between kin. Many of the current residents of Aliabad were previously tenant farmers who had immigrated from other villages, and in several cases (such as the village in rank 4) such individuals arranged to marry kin from those villages. It seems likely that several of the other marriages tabulated here represent the same kind of arrangement with, for example, cousins whose parents had stayed behind in their natal village. In fact, the majority of villages from which Aliabadis have immigrated during the past few decades are included in the group with which the younger generation, represented in Table 5.12, intermarries.

Several villages located quite near Aliabad are not included in Table 5.12. This omission probably reflects the small size of the sample, but it may also indicate a bias in the marriage patterns themselves. Some villages may be preferred over others for marital alliances, although such preferences need not necessarily imply an active avoidance of affinal links with neighboring villages not included in this list. Most of the former tenants' natal villages not included in this table are situated within a radius of 20 km from Aliabad (one man, not listed here because of incomplete data on his parents' origins, immigrated from a village about 50 km away, near Malayer). Unlike a Colombian case described by Jackson (1976), a large proportion of marriages seems to occur between these villagers and their nearest neighbors (in the case of Aliabad, the village in rank 1). The data presented here, therefore, suggest that there is an element of "distance decay" in marriages between natives of Aliabad and other settlements. Interaction, as expressed in marriage frequencies, appears to increase with settlements' proximity.

Patterns of marital alliance on this regional level have implications for evaluating other forms of interaction. At present, there is no ceramic production or local manufacture of other items that might be used to measure interaction among the villages tabulated here.²² Aside from information on marriages, there are at present no suitable data with which to "test" a gravity model or to explore further the nature of the plateau effect, which may be a more complex phenomenon than is suggested by Plog's formulation. For example, the Aliabad data suggest that marital alliances may be influenced by locational considerations, which may be operative even within a fairly small geographic area; here, differential interac-

²²Ideally, such items would be produced and used by all households, and preferably not be made for commercial purposes. Rugs, therefore, would not qualify for consideration here, although they might elsewhere in Iran.

tion as reflected in marriages occurs within an area (or plateau) in which one might have expected distance decay to be inoperative.²³

At present villagers are not bringing artisans' skills to their new villages, so there is no craft category that reflects (marital) interaction among villages. However, there is a culturally valued practice of out-marrying persons frequently visiting their families of orientation in their natal villages. Such visits, which sometimes (but not often) last for several days, entail the carrying of goods and information in either direction. Perhaps the apparent size of the plateau in the Aliabad area reflects, in part, the maximal acceptable length of a round-trip walk, visit included, in a single day.²⁴ According to Adams and Kasakoff (1976:158), members of various societies with endogamous groups "seem to go the same distance for their spouses." In their sample, as in Aliabad, most spouses were "found within a day's journey, that is, 7 miles, and usually the distance is under 4 miles." Under such circumstances, it might be reasonable to assume—as some archaeologists have done—that if mothers were teaching daughters to make pottery, if daughters' pottery were demonstrably like that of their mothers, and if women tended to marry out, then there would probably be a fall-off in the occurrence of stylistically similar ceramics corresponding to daughters' distances from their natal villages. Stylistic similarity might then be a useful measure of one form of interaction among settlements.

SUMMARY AND ARCHAEOLOGICAL COMMENT

This chapter has reviewed selected aspects of contemporary settlement patterning and land use in central western Iran and adjoining areas. The aim has been to describe and evaluate contemporary data which might be useful in interpreting archaeological material collected and analyzed from a regional perspective, and to point up problematical issues that may merit further investigation. The material reviewed suggests that—on average—rural settlements in this area are just a few hectares in size, with population densities of well below 150 persons per hectare. Villagers live in households of 5 or 6 persons, and require something on the order of .5 ha per capita per annum for subsistence.

²³On the small Polynesian island of Tikopia (roughly 15.5 km² in area), differential distances within the area considered by Plog to be subject to the plateau effect also seem to affect the patterning of marital alliances (Kasakoff and Adams 1977).

²⁴The major stopping points for travelers between Kermanshah and Hamadan are Bisitun (Behistun), Sahneh, Kangavar, and Asabadad. It is interesting that the distance between Kermanshah and Bisitun is described as "a day's march" (LeStrange 1905/1966:187); Bisitun had an important medieval caravansarai, and still has several tea house-hostels for those who cannot reach Sahneh (to its east) on the same day. The distance between Bisitun (via Sahneh) and Kangavar (approximately 50 km) is described as taking about 12 hours (on horse or camel) on the main road in the early nineteenth century (Buckingham 1829/1971:150). Today, Kangavar's largest tea house doubles as a hostel for long-distance travelers; it is situated at the intersection of one of Kangavar's two main streets with the Kermanshah-Hamadan (Baghdad-Tehran) road.

As at the community level, there are variations within this region. This diversity becomes increasingly apparent with an increase in size of the area and sample analyzed, and suggests that if archaeologists want to understand systemic processes that integrate households and communities, they must develop strategies for monitoring not only intrasite variability, but intersite differences as well. Comparative data for other parts of Southwest Asia indicate that both regional and settlement population densities vary from one area to another, but that regardless of such interregional variation, population and area of small-scale rural settlements are strongly and positively correlated. In villages, the relationship appears to be fairly linear, implying that crude population estimates for prehistoric rural settlements within individual regions may, after all, be obtained by dividing site area by number of people. Demographic and areal data from a sample of Iraqi towns of the World War I period also reflect a linear relationship between the two variables, and a small and somewhat problematical sample of urban centers in the Zagros area may manifest a similar pattern but also suggests that the relationship between settlement area and population is complex. Along with some historical and theoretical geographical literature, ethnographic data can be used to argue that the causal interrelationships among site area, population, and function might be elucidated by further research.

The material discussed here also suggests that archaeologists could be more rigorous in specifying their assumptions about the meaning of differences in site areas as well as the role of areal data in generating population estimates and reconstructing site hierarchies. One issue that has emerged as a significant problem is the reconstruction of site population and function from areal data alone. Archaeological surface surveys generally use site area both to estimate population size (generally by employing some baseline estimator, such as those discussed above, but sometimes also utilizing differential density of surface artifacts) and to classify them as to function (such that large sites are said to have been towns or cities [or "centers"], whereas smaller ones are identified as hamlets or villages). Data reviewed here suggest that although in smaller-sized settlements there does appear to be a fairly straightforward linear relationship between population and area, density as well as area may increase with settlement age. This is perhaps also true in towns and cities, where density may be an even more complex matter than it is in villages. Functionally larger settlements appear to be internally more differentiated in terms of their built structures (Monkhouse and Wilkinson 1973:421), and this may be true of their population densities as well, with (older) city centers comparatively more crowded, and perhaps housing poorer people, as well as large, functionally specialized, nonresidential structures. All of this would suggest that archaeologists should further consider the problem of distinguishing between large villages and small centers, and also assess the means available for drawing representative samples of all segments of internally more differentiated centers. Chronological variations in architecture and differences in

residents' economic statuses might, for example, be revealed in a transect from the (older, sometimes poorer) center of a site to its (more recent, perhaps wealthier) periphery.

Functional differences among settlements might be reflected in the types and diversity of objects found on sites' surfaces during survey work. Efforts to develop measures of diversity (Peet 1974) include a classification of sites surveyed by Fish *et al.* (1978), and analyses of engraved bone artifacts (Conkey 1980), of Maya ceramics (Rice 1981), and of !Kung camps (Yellen 1977). Yellen reports that more activities are carried out in base camps than in other kinds of sites, and that the variety (and presumably the number) of objects increases with duration of occupation (Yellen 1977:101ff.). In !Kung camps, therefore, artifactual diversity is related to both settlement longevity and function. In a treatment of more complex socioeconomic systems, Skinner discusses differences in the variety of goods in centers of differing functional size. He notes (1977:277) that "the set of goods supplied by a more complex [higher-order] center includes all goods supplied by simpler centers plus an increment of different higher-order goods." And in a study of old Delhi, Fonseca (1969:108) notes that bazaars on primary streets have more diverse sale items than those on secondary streets, which tend to be more specialized. These studies suggest that diversity of artifacts may be used to provisionally differentiate archaeological sites in terms of functional size, and even perhaps to rank areas within larger sites in terms of their functions. Relationships among functional size, population size, and settlement area might be investigated in research designed to define them on the basis of three (or more) independent data sets.

Artifact density as well as diversity may be a useful measure of differences within and among sites. Costello (1976:101) has suggested that "the larger the settlement the greater is the range of densities"; he is primarily concerned with contemporary and recent historic settlements, and refers to modern population densities. Assuming that artifact densities are related to populations which discard objects, some Mesoamericanists use artifact density on site surfaces to estimate prehistoric population sizes. As Parsons (1972) indicates in discussing his Texcoco (Mexico) survey, some

functional aspects have been tentatively inferred at a very general level from considerations of size, location, architectural characteristics, and quantity of occupational debris. The major problem produced for this stage of analysis is in population estimation. [This is based on artifact density.] Having no proper understanding of site function, we consequently are unable to describe a settlement system. . . . as it is very probable that settlement systems were changing rather radically in this region over time, we are often unable to tell whether a substantial change in number of sites from one period to another implies a significant change in population size, or a major change in the settlement system, or both [p. 142].

This statement of a fundamental problem, in conjunction with Costello's hypothetical assertion and the material discussed above, suggests that both ar-

tifact diversity and differential density of surface remains might merit further systematic investigation in contemporary as well as archaeological settings.

Archaeologists will doubtless continue to draw on the locational models of theoretical geography. Rather than automatically assuming that any one archaeological site is typical of an area, regionally oriented work will increasingly reveal ranges of variation as well as modal tendencies. Research carried out on a regional scale can also show, in a way that more traditional site-oriented research may not, how ancient sites articulated with one another and with their natural landscapes, thereby permitting a more effective monitoring of some aspects of variation and change over space and time. Future research may also clarify criteria useful in defining region boundaries (cf. Hodder 1977), and help archaeologists to evaluate the ways in which modifying the scale of observation may affect sampling strategies, data analysis, and interpretation.

The present study suggests that information about historical relationships among settlements, and the relative ages of particular large centers and smaller neighboring settlements, might illuminate some processes that occur on a regional scale. It might, for example, be interesting to know more about how settlements fission, and whether "centers" tend to be so designated after they achieve large areal or functional size, or whether such growth follows government designations, as happened in Zamanabad (northeastern Iran), in Malayer (in the central Zagros), and also perhaps in the Kurdish border town of Paveh. This kind of information should clarify processes involved in formal changes within individual settlements integrated on a regional level. More ethnoarchaeological work on a regional scale and in urban centers would be useful. Maps, aerial photographs, and census data will be most informative when complemented by information on the material correlates of functional differences among settlements. Maps do not reveal the number of stories in different buildings, the range of building materials, the use of rooms, or their occupants' numbers, economic statuses, occupations, relationships, or places of origin. Rather than rely solely on the work of sociologists and geographers, and on the aggregated data of published censuses, archaeologists should use anthropological techniques to collect data designed to answer their questions. As articles in C. Smith's compendium (1976) show, these techniques can be effectively combined with the data, methods, and theory of history and geography. Such research in contemporary societies can be coordinated with archaeological surface survey and excavation in longitudinal studies of regional problems.

6

Sites and Regions in Prehistoric Central Western Iran



The foregoing detailed description of a contemporary village and more general overview of its surroundings provide a backdrop for the present chapter, which reviews prehistoric data for the central Iranian Zagros and extends the time depth for some of the environmental features and cultural patterns outlined above. In this area, archaeological excavations and surveys permit a partial reconstruction of features of ancient land use and shed light on the content and spatial patterning of early villages. The available data indicate that in broad outline the natural environment, patterns of land use, and settlement pattern and internal organization of villages were comparable with those of the present by 5500 years ago.

In considering modern land use and patterns of settlement that are potentially analogous to those of the past, it is essential to consider the possibility that prehistoric climate and subsistence resources may have differed substantially from those of the present. Indeed, the likelihood that such differences cannot be adequately documented has figured in some arguments against the use of analogical reasoning in analyzing prehistoric data, but such limitations need not be insurmountable (Kramer 1979c:2). Several lines of evidence suggest that contemporary climate in Southwest Asia differs in some respects from climates of the late Pleistocene and early post-Pleistocene epochs. In theory, at least, climatic changes would have affected the nature and distribution of faunal and botanical communi-

ties, and therefore subsistence options and perhaps carrying capacity. Irrespective of alterations in productive resources resulting from changes in temperature, precipitation, and other climatic variables, it is generally agreed that recent land use practices have altered the Middle Eastern landscape, adding to the difficulty of extrapolating from present to past. In the Zagros area, such practices include the removal of trees and woody shrubs (most often for fuel); overgrazing by sheep and goats, with consequent replacement of some floristic elements as well as compaction of topsoil and increasing degradation of root networks, all contributing to increased surface runoff and wind erosion; increasingly intensive plant cultivation and a gradual depletion of organic matter in soils; and increasing irrigation, with associated salinization occurring in some localities.¹ Such practices and their effects can be found throughout Southwest Asia; the extent to which they have modified areas' appearances varies regionally, but most such transformations, including those in the Kangavar area, are incompletely documented. For our purposes it must suffice to discuss the nature of unmodified modern "climax" conditions and the date of their initial appearance in this region.

PREHISTORIC CLIMATE AND VEGETATION

Environmental changes are commonly monitored by comparing modern geological processes with evidence of those of the past, and the composition and distribution of plant and animal communities with those of their ancient counterparts. Relict floral distributions, ancient pollens, and geomorphology are often used to reconstruct past climates and habitats and, in the Middle East, archaeological remains of domesticated plants and animals have also been used to establish the locations and dates at which various species were brought under human control. When such species are found archaeologically, there is some basis for making uniformitarian assumptions about their environmental contexts; for example, we know (or can learn) what edaphic and climatic requirements particular plant species have, and assume that their prehistoric counterparts were substantially similar.²

The central Iranian Zagros, including the area between Kermanshah and Hamadan, was described in Chapter 2 as deforested. In general, arboreal vegetation responds not only to edaphic and altitudinal variables, but also to precipitation. At present, there is said to be relatively little natural arboreal vegetation

¹I am assuming that while such degrading practices may affect productive strategies, sometimes in subtle ways (yet to be described in quantitative terms for central western Iran), they do not significantly affect spatial patterning or internal organization of villages, and that absence of detailed data on recent degradation does not seriously weaken the following discussion.

²In some cases, fine-grained microenvironmental reconstructions can be developed by using the remains of small mammals, particularly rodents, but such efforts have yet to be undertaken systematically in the Kermanshah-Hamadan area (see Redding 1978).

either on the Assyrian steppe and piedmont or on the Iranian plateau, which flank the Zagros Mountains on the west and east respectively. In the Zagros, at elevations between about 800 and 2000 m, where annual precipitation generally exceeds 500 mm, arboreal communities with a prominent oak component replace the grasses and shrubs characteristic of more arid steppe areas (van Zeist 1967:302). At higher elevations, lower temperatures again limit the distribution of oak (*Quercus*), an arboreal genus that figures in paleoenvironmental reconstructions in this area. Given its altitude and precipitation, the Kangavar area lies in what could at least theoretically be characterized as the eastern margin of a (climax) oak woodland and or forest.

Little botanical information is available for the immediate vicinity of Kangavar, but the modern vegetation of the Kermanshah–Hamadan area more generally has been discussed by Zohary (1963, 1973) and Wright *et al.* (1967). Modern pollen rain and pollen spectra have been compared with surface floral communities, and used in conjunction with ancient pollen to reconstruct earlier vegetation patterns in the area. Wright *et al.* report on three modern samples from the Kermanshah area³ and several others to the southwest of Kuh-i Parau, the large mountain on which the famous trilingual Bisitun inscription is carved and which may be considered the easternmost point of the Kermanshah plain, roughly 50 km west of Kangavar. These sampled areas are described as now part of the “inner deforested area” of the Zagros, and the Kermanshah samples show relatively lower percentages of oak pollen than those nearer Ilam (to the southwest) and other areas in the Zagros woodlands.⁴ The Kermanshah samples also have low percentages of sagebrush (*Artemisia*),⁵ a plant characteristic of arid steppes, and proportionally higher percentages of grasses (Gramineae) than are found in lower piedmont and steppe areas. Like Pabot (1960:21f.) and Zohary (1973:269), Wright *et al.* (1967:436) report that small patches of oak and pistachio (*Pistacia*) occur in the Kermanshah area. They infer that such dispersed trees, some of them stunted and shrublike, represent an originally more widespread climax community thought to have extended to the area east of Kermanshah. In discussing this point, Zohary lists a few species associated with oak in this area today, and notes that the oak-dominated community tends to be replaced at lower elevations with a steppe–forest association consisting of scattered pistachio, almond (*Amygdalus*), and maple (*Acer*) trees, along with such steppic herbaceous and tragacanthic shrubs as sagebrush and gum tragacanth (*As-tragalus*; Zohary 1963:55, 1973:269). The lengthy list of genera associated with oak and pistachio includes trees and shrubs, and weeds characteristic of culti-

³These are samples 22, 34, and 60 in their “Ilam transect.”

⁴The Kermanshah area samples have 15–20% oak, as compared with 46–92% in Ilam. Elsewhere in the Zagros, *Quercus* averages about 35% of the pollen spectrum, according to Wright *et al.* (1967:437).

⁵The Kermanshah samples have about 15% or less. Duisberg and Hay (1971:249) say that the present distribution of *Artemisia* in Iran is in areas with 125–500 mm of rainfall.

vated and irrigated fields.⁶ Many of these species have uses as fodder, fiber, narcotics, pharmaceuticals, oils, tannins, mucilages, building material (woods and twigs for structures, tools, and containers), and food (fruits, nuts, and seeds).

Zohary has also noted that massive stands of wild cereals (einkorn, *Triticum boeoticum*, and barley, *Hordeum spontaneum*) are found today in the oak forest in the area between Shahabad-e Gharb and Ilam, to the southwest of Kermanshah (1969:57). These species are generally considered ancestral to the modern cultivars which are the most important food source in the area today. Wild emmer wheat (*Triticum dicoccoides*) may also be native to the Zagros (van Zeist 1969:66), but its distribution is somewhat more problematical than those of einkorn and barley. The association of the economically important cereals with oak could suggest that their domestication was possible only with the appearance of oak in the area (see also Wright 1976).

In summary, the consensus appears to be that in the central Zagros the current distribution of oak (and, to a lesser extent, pistachio) indicates a relict population reflecting the existence of an earlier and more widespread oak woodland or forest. Botanists also agree that the area's floral communities have been extensively transformed as a result of forest clearance, livestock herding, and plant cultivation. Some botanists think that an oak–pistachio woodland once extended from Kermanshah to Hamadan, although Zohary (1973:38) considers this area to fall, today, within the “steppe forest climax” zone. This oak–pistachio community is somewhat better “developed” (i.e., is denser woodland) on the Iraqi side of the Zagros, perhaps because arboreal vegetation is less degraded on the Iraqi side of the modern border, which in any case has somewhat higher precipitation. This variability within the central Zagros is relevant to a consideration of the prehistoric pollen spectra discussed below.

Problems pertinent to the analysis of prehistoric occupation in the area but still

⁶M. Zohary collected data on floral distributions in the area between Kermanshah and Hamadan, but reports on only the most visually conspicuous species along the main (Baghdad–Tehran) road (1973:269). He describes the area between these provincial capitals as lying within the “climax area of *Quercetia brantii*” (oak), but comments that there are very few traces of such forest in this portion (segment G) of his transect (1973:273). Single trees or small stunted stands of oak were observed among a dense cover of tragacanthic communities on nonarable land and various segetal plant communities on cultivated or “semicultivated” land. Among the prominent weedy species, Zohary noted varieties of *Glycyrrhiza* (licorice), *Hulthemia*, *Peganum* (rue), and *Euphorbia* (candelilla wax). *Hulthemia* is found in abandoned fields, whereas *Glycyrrhiza glabra* is characteristic of irrigated fields. Other genera noted in this portion of Zohary's transect include *Carthamus* (safflower), *Crataegus* (hawthorn), *Amygdalus* (almond), and *Picnemon*. Zohary has also noted (1963:93f.) that the Zagrosian oak forest association most often includes trees and shrubs of the genera *Acer* (maple), *Amygdalus*, *Anagyris* (bean clover), *Cerasus* (cherry), *Cercis* (Judas tree), *Crataegus* and *Paliurus* (steppe shrubs), *Pistacia*, *Pyrus* (pear), and *Phamnus* (buckthorn). Throughout the Zagros, riparian associations often include the arboreal genera *Platanus* (plane), *Populus* (poplar), *Salix* (willow), and *Tamarix* (tamarisk), whose woods have a wide variety of economic uses. Steppes and fields harbor tragacanthic plants, often armored with spines and apparently unpalatable and naturally protected against grazing animals (see Zohary 1963:15). Flannery (1969) discusses the archaeological implications of the relationship between grazing and the distribution of *Stipa*, a steppe plant often associated with land degrading practices (Guest 1966:71).

unresolved include the original spatial configuration of this woodland, and the extent to which it was dense (i.e., forest, rather than more open woodland mixed with steppe species); the extent to which oak dominated an arboreal complex including juniper, pistachio, and almond; and the chronological parameters of the various possible vegetation associations and changes therein. Today the oak-woodland belt attains a width of only 50–100 km (Wright 1968:336). It has been suggested that in the central Zagros, an earlier oak-dominated belt may have attained a maximum width of some 250 km, extending as far east as Hamadan (Wright *et al.* 1967:419). Following M. Zohary, this reconstruction views the climax Zagrosian oak-pistachio belt as having reached its maximum extent in the area between Zeribar (Lake Merivan) and Khorramabad (in Luristan, about 110 km south-southeast of Kangavar; see Figure 1.1). This zone may thus have encompassed the area around Kangavar, although McAndrews and Wright have expressed the opinion that the Kangavar area was never very heavily forested (McDonald 1979:108). It is conceivable that Malayer, Arak, Tuyserkan, and Hamadan, east of Kangavar and closer to the arid Iranian plateau proper, differed somewhat in their vegetation cover, falling in a more steppic zone dominated by almond and pistachio rather than oak.

Zohary's reconstruction places climax oak forest in at least portions of the area between Kermanshah and Hamadan. In his map Kangavar (and the Aliabad area) are situated in the deforested pistachio-almond zone, but Zohary notes that this falls in the oak climax area, and says that *Artemisia*, *Quercus brantii*, and *Pistacia-Amygdalus* "belong to the same climatic vegetation complex [but] may replace each other with the increase or decrease of the annual amount of precipitation [1963:7]." If Zohary's reconstruction is correct, Kangavar, in the recent past before the area was disturbed by modern land use practices, lay near a boundary between contiguous floral communities dominated by oak on the one hand (nearer Kermanshah) and pistachio-almond on the other (nearer Hamadan). Regardless of its actual geographic distribution, the occurrence of oak in late prehistoric times may have been restricted to higher elevations at valley margins. Although reconstructions of earlier plant distributions are based largely on modern occurrences of plant species viewed as relict survivors of previously more widespread populations, the foregoing indicates that interpretation of such relicts is not a simple matter. Nonetheless, reconstructions of the distributions and compositions of the prehistoric floristic associations that these "survivors" represent are closely bound up with reconstructions of paleoclimates and environmental changes.

Reconstructions of the ancient climatic sequence for the Zagros area depend heavily on pollen profiles based on borings in a few Iranian Zagros lakes and springs, which are frequently cited in discussions of Middle Eastern Pleistocene and post-Pleistocene climate. Contemporary botanical data, including those discussed above, have been used as baselines against which prehistoric collections

are compared. A statement of the major assumptions underlying palynological reconstructions is worth quoting at length:

Historical studies through pollen analysis . . . require two supplementary programmes in addition to the collection of sediment cores and the actual preparation of the pollen diagram, especially in new areas. First the phytogeography of the area must be surveyed, with some attention to the climatic, microclimatic, edaphic and human factors where appropriate or possible. Then samples of moss or surface soil must be taken from representative localities over a wide area to determine by pollen analysis the relation between the modern pollen rain and the modern vegetation. If these pollen spectra match any spectra in the sediment core, then we have a basis for reconstructing past vegetation and, by extension, climatic conditions. If no match can be made, then we must either look elsewhere for modern analogues or conclude that the past vegetation of a particular time interval near the site has no modern counterpart [Wright *et al.* 1967:415].

Pollen cores are most useful to archaeologists when they can be dated. The reconstructed pollen spectrum will (ideally) provide information about the sequence of plant communities (and, by extrapolation, of ancient climates). It will illuminate human behavior related to plants (such as forest clearance, overgrazing, or cultivation of particular species) if such behavior was associated with diagnostic species whose pollen is preserved.

The Zagros work summarized by Wright *et al.* is, in their terms, in a “new” geographic area. They caution that their pollen samples are not completely representative of the modern plant cover in the same localities because some species tend to be underrepresented in pollen spectra (generally for reasons associated with their seed-dispersal mechanisms), because some pollens are not readily identified, and because only the month in which the sample was collected is represented in the spectrum. In samples from the savanna zone of the Iranian Zagros, for example, the pollen percentages of modern grasses are lower than their actual distribution on the ground might suggest (Wright *et al.* 1967:423). Similarly, maple, almond (van Zeist 1967:310), and pistachio (Wright *et al.* 1967:435f.) tend to be underrepresented in modern pollen rain, whereas oak is often overrepresented. Pollen may not accurately reflect cultivation of cereals (Wright 1980), and because vegetation (and pollen) also reflect overgrazing, cutting, and other contemporary and recent causes of degradation referred to above, they are not necessarily isomorphic with the climax vegetation of the same environmental zone.

Prehistoric palynological data have been obtained in four frequently cited localities in the central Iranian Zagros. Two of these are still essentially unpublished: Lalabad, some 40 km northwest of Kermanshah, and Nilofar, some 15 km northwest of Kermanshah (Wright 1968). This is unfortunate, since of the four sources these are nearest Kangavar. Preliminary comments on these cores indicate that they are from a zone which today can be characterized as steppe-woodland. They might thus differ somewhat from the oft-cited and more fully

published pollen profile obtained at Lake Zeribar (Merivan), located about 160 km northwest of Kermanshah in denser oak woodland at some 1300 m above sea level, and from the fourth locality, Lake Mirabad (some 75 km southwest of Khorramabad, at an elevation of about 800 m). Possible (but as yet undescribed) differences in vegetation communities in the Mirabad–Zeribar areas, on the one hand, and the Lalabad–Nilofar area, on the other, might relate to a greater degree of recent degradation (deforestation) around Kermanshah, with consequent increase in steppic plants, and/or to long-standing regional differences. (The higher, cooler, more easterly slopes of the Zagros characteristically receive less precipitation and hence have a somewhat lighter arboreal cover, of “woodland” rather than “forest”.) Such possible differences cannot be evaluated until the analyses and publication of the Lalabad and Nilofar cores are complete.

Of the west Iranian cores, those taken from Lake Zeribar are the most extensively published to date (van Zeist and Bottema 1977); the overall picture may be summarized as follows. During the latter portion of the last (Würm) glacial phase (ca. 20,000–ca. 12,000 B.C.) the Zeribar area was dominated by *Artemisia* and chenopods, from which a climate drier and cooler than today's, characterized by essentially treeless steppe vegetation, has been inferred (van Zeist 1967:301; van Zeist and Bottema 1977:65). The lower portions of the Lalabad and Nilofar cores are said to show a comparable pollen assemblage (van Zeist 1967:309), and might therefore be taken to reflect comparable climatic and floral patterns in the more easterly Kermanshah area. *Artemisia* declined and pistachio increased in Zeribar's zone 4 (dating from ca. 12,000 to ca. 8500 B.C.). An increase in arboreal pollen after about 8500 B.C. suggests that the Zeribar area experienced gradual climatic amelioration, and the decrease in chenopods and *Artemisia*, and increases in oak and pistachio pollen in Zeribar's zones 5 and 6, may imply the development of true woodland. By about 3500 B.C. (the approximate date of the Zeribar zone 6/7 boundary), the pollen spectrum shows elements of that seen today, suggesting that by then arboreal climax vegetation and therefore precipitation and temperature conditions may have approximated those of the present (van Zeist and Bottema 1977:83).⁷

The Mirabad core, to the south, is described as basically similar to that of Zeribar (van Zeist 1967:306). After about 6000 B.C. the percentage of oak pollen increased fairly steeply here too, and by about 4000 B.C. oak had reached high, essentially modern, values (approximately 50%). The Mirabad core is not as closely dated as that of Zeribar, but it would appear that by about 8000 B.C. (the

⁷Today, the estimated annual precipitation for the heavily deforested Merivan (Zeribar) area is 600–800 mm, and temperatures range from 2 to 28°C, (van Zeist and Bottema 1977:29). Van Zeist (1967:304) has said that mean annual precipitation in Khorramabad is 733 mm and temperatures range from 5 to 29°C, although he has more recently reported estimates of 500–600 mm, and mean extreme temperatures of 7° and 32° (van Zeist and Bottema 1977:31). Ganji (1968:247) gives a low figure (504 mm) for Khorramabad, and lists annual rainfall in Kermanshah and Hamadan as 373 mm and 385 mm, respectively. I have no data on average annual precipitation in Kangavar, but presume it to be in the same range.

base of Mirabad's zone 5), the area was a savanna-woodland habitat in which pistachio and grasses outnumbered oak, perhaps indicating a climate cooler and drier than that of the present, but warmer and moister than the preceding period. Subsequently, oak increased markedly, and then fluctuated until reaching modern Zagrosian levels in the upper portion of the core. During the poorly dated period when the upper portion of the Mirabad core deposits was laid down, plantain (*Plantago*) pollen also increased. This plant has been variously described as an indicator of lower elevations (Wright *et al.* 1967:439), as a reflection of increased grazing (van Zeist 1967:308), and, in Deh Luran, as associated with increases in other pasture plants and suggesting the spread of a farming system involving fallowing (Flannery 1969:88).⁸

Although similar in their general contour and content, the Mirabad and Zeribar cores differ in their respective zones 5, both of which correspond to the period of the earliest Zagros villages. The Mirabad core reveals slightly higher percentages of oak, pistachio, chenopods, and plantain, and slightly lower percentages of sagebrush, but it also shows a more jagged profile for increases in oak and decreases in chenopods. The fluctuations in these segments of the pollen profiles are paralleled by reconstructions based on limnological data from Zeribar and are reminiscent of fluctuations reconstructed from the Persian Gulf sediments (discussed below) and tentatively dated to the period between ca. 7000 and 4000 B.C. At lower elevations than the Zeribar basin, the Mirabad area may have been marginally moister and warmer; today, it is slightly warmer, and has slightly higher oak pollen rain than does Zeribar (Wright *et al.* 1967:434).

Diatoms and crustaceans in the Zeribar deposits seem to reflect the same climatic trend as that reconstructed from their pollen. Until ca. 9500 B.C., the lake was slightly cooler than it is at present. Aquatic flowering plants and diatoms dating to the period after about 9000 B.C. suggest that there were intermittently lower lake levels and a warmer or drier climate than previously. Warm-temperate cladoceran species became more common after about 9000 B.C., and the cool-temperature species characteristic of earlier deposits disappeared

⁸One published radiocarbon date (10,370 B.P.; Wright 1968:337) is from the lower portion of Mirabad's (lowest) zone B (now referred to as Zone 5 by Bottema and van Zeist [1977:60]). In this section of the core, pistachio and oak combine to comprise nearly 20% of the total pollen; nonarborescent species are more heavily represented by Chenopodiaceae (goosefoot family) and Gramineae (grasses) than by *Plantago* or *Artemisia* (a steppe and/or plateau plant). In the basal portion of Mirabad's (later) zone C, which is not firmly dated, the percentage of oak pollen increases (rising to 80%). There is an associated decrease in pistachio, plantain, and chenopods. Higher in zone C, oak decreases slightly, fluctuating between 40 and 60%. In its uppermost segment, the Mirabad core shows oak pollen comprising 30–50% of the spectrum, higher than the levels recorded in modern pollen rain (van Zeist 1967:308). (High plantain values are also said to be characteristic of lower elevations; see Wright *et al.* [1967:439].) Regardless of the precise nature of their vegetation cover during the late Pleistocene, some upland valleys in the central Iranian Zagros were occupied, if only on a seasonal basis. This is seen in the Baradostian and Zarzian remains found by Smith (1971) in the Kermanshah area, by Hole and Flannery (1968) in the Khorramabad valley, not far from the source of the Mirabad core, and by Mortensen (1974) in Hulailan, where today oak trees are "scattered over the mountains" forming the borders of the Hulailan plain (Edelberg 1966–1967:376).

(Wright 1968:338). By about 3500 B.C., the lake was again deep, and the fluctuations of the period ca. 12,000–4000 B.C. had ceased (Vita-Finzi 1969:967ff.). With the development of conditions approaching those of the present, runoff to the headwaters of the Diyala River increased (Vita-Finzi 1969:967ff.), and this change is reflected in Persian Gulf sediments (Sarnthein 1972).

This account of the botanical evidence used in reconstructing ancient Zagrosian climates is simplified, and it skirts some of the problems that these data raise. Perhaps chief among these (aside from insufficient chronological control) is the interpretation of the presence or absence of particular plant species based on the distribution of their modern counterparts. For example, on the basis of low percentages of arboreal pollen, van Zeist (1969) suggested that terminal Pleistocene climate was not substantially colder than it is at present, but that summers were longer (and/or slightly warmer and drier; cf. also van Zeist and Bottema 1977:83f.). Others, including Butzer (1975), cite the oak data to argue that the late Pleistocene Zagros was colder and drier than it is now. *Artemisia* (sagebrush) and chenopods (goosefoot) both imply arid steppic habitats, but there may be some question as to whether they imply specific temperature regimes as well (Guest 1966:97ff.; Pullar 1977; Wright 1980; Wright *et al.* 1967). Furthermore, changes in values for *Artemisia* may reflect human interference with local vegetation communities rather than substantial changes in climate (Pullar 1977), and the same is apparently true of *Plantago* (plantain), as has been noted. Both *Plantago* and oak increase at the base of zone 5 of the Zeribar core (ca. 8500 B.C.; Butzer 1975:400; Pullar 1977:16). And oak, as was indicated above, is associated with wild einkorn and barley.

Despite this association, it cannot be assumed that these wild cereals were being manipulated as early as ca. 8500 B.C., when oak and plantain began to increase. For one thing, it has been observed that grasses tend to be underrepresented in modern pollen spectra, and oak overrepresented, so the actual proportion of cereals to other species remains an open question (see Wright 1968:146). In addition, there is some disagreement as to the nature of the oak component. Butzer (1975:400f.) notes that both Harlan and Mikesell consider degraded oak scrub to produce more pollen than undisturbed climax oak forest; M. Zohary believes the opposite (and he is a key source for Wright *et al.*). If Harlan and Mikesell prove to be correct, the marked increase in oak pollen in the Zeribar core between about 6000 B.C. and about 4000 B.C. may reflect not colonization by oak, but an intensification of human activity involving deforestation and the replacement of oak woodland with scrub parkland. Such degradation could result from increased browsing, cropping, and/or cutting. Butzer does not discuss the implications of the debate about oak for interpreting the contemporaneous distribution and/or use of grasses associated with oak, but D. Zohary (1969:56) has noted that wild einkorn and barley diminish under “heavy grazing pressure,” although they reestablish dominance soon after grazing ceases, and Pullar (1977)

has made a case for manipulation of vegetation as early as ca. 12,000 B.C., using genera that reflect disturbed soils to support her argument. Future research should resolve these issues.

In addition to relying on botanical information, paleoclimatic reconstructions often incorporate geomorphological data, which in the central Zagros consist primarily of soils and problematical ancient snow lines. Snow-line data are used to reconstruct late Pleistocene temperatures; they are not considered here because the focus is not on late Pleistocene land use (summaries are provided by Braidwood and Howe 1960; Hesse 1978; Smith 1971). Geomorphological work by I. Brookes in the Mahidasht–Kermanshah area may shed at least indirect light on post-Pleistocene climate in the Kangavar area, whose geomorphology has been discussed by Vita-Finzi (1969).

Brookes' work in the Mahidasht–Kermanshah area allows a tentative reconstruction involving a period of alluviation in the late Pleistocene through early Holocene (post-Pleistocene; Brooks *et al.* [n.d.]). The earliest sedimentary units (VI–V) described by Brookes *et al.* apparently correspond to Vita-Finzi's Tehran Alluvium which, on the basis of associated artifacts, has been provisionally dated from 50,000 B.C., at the earliest, to about 4000 B.C. (Vita-Finzi 1969:951, 969). At several points along the river Ab-i Marik, Brookes has observed a stratum of poorly sorted sand and gravel (unit IVa) separated from the lower alluvium by an erosion surface (Brookes *et al.* [n.d.]; Levine 1974:488). This depositional unit may date to the span from Parthian times (beginning ca. 220 B.C.) to the early Islamic period. It is overlain by thick deposits of finer-grained alluvial sediments, at least some of which presumably correspond to the so-called Khorramabad Alluvium, tentatively dated to the Middle Ages—specifically, to the Little Ice Age, beginning in the mid-sixteenth century A.D. (see Vita-Finzi 1969:971).

The geomorphology of the Kangavar and Mahidasht areas suggests that a period of environmental stability, perhaps not too different in some respects from that of the present, characterized at least part of the period from the early Holocene until the Parthian. It is not entirely clear what date should be assigned to the onset of the “early Holocene” (although the radiocarbon-dated pollen record has been used for this purpose), and the dating of the terminal Pleistocene alluviation in Kangavar and Mahidasht is therefore uncertain. In the Chemchemal area of the Iraqi Zagros, the lower of two possibly parallel alluvial deposits was dissected by erosional processes, and most of this dissection seems to have been completed by the early seventh millennium (Vita-Finzi 1969:966). In the Mediterranean area, the older of two alluvial fills was being dissected “some 8000 years ago” and, as in Iran, a later alluvium dates to the medieval period. It is thus conceivable that the long period of stability represented by the deposits separating the Tehran and Khorramabad alluviums had begun by about 4000 B.C. (if not earlier) when, according to most interpretations of the Zeribar pollen core, climate had achieved its modern characteristics.

What is both germane and indisputable is that subsequent erosion and deposition have had the net effect of raising at least portions of the valley floor and burying some early Holocene sites. This has happened in the Mahidasht-Kermanshah area (Brookes *et al.* [n.d.]; Levine and McDonald 1977:46), and evidence for the burial of early sites has been noted elsewhere in the central Zagros. In work in the Khorramabad area, J. Berman (personal communication) observed sherds of Partho-Sasanian type along one riverbank section at a depth of about 70 cm below the modern plain surface, and Hole notes that active erosion in Luristan has probably buried some early sites (Hole n.d.). At the seventh millennium site of Ganj Dareh, near Harsin (Luristan), there is at least 1 m between virgin soil and the current plain level (Smith 1972:183), and at Seh Gabi, near Aliabad, deposits dating to the late fifth and early fourth millennia lie several meters beneath the modern valley floor. Similar occurrences of virgin soil at substantial depths below modern surfaces are reported elsewhere in the Zagros area: Tepe Sabz, for example, has early deposits at a depth of about 3.5 m (Hole *et al.* 1969:50), and the deepest occupations at Hajji Firuz and other sites in Azerbaijan are also well below modern plain level (Voigt 1976). Whatever else the geomorphological evidence indicates about ancient climate and climatic changes, it suggests that many prehistoric sites are essentially invisible. Some of the sites which have been found were not all inhabited by people who had to contend with environmental conditions identical to those of today.

Vita-Finzi (1969) and Butzer (1975) believe that Zagros highlands experienced colder and drier conditions during the latter portion of the Würm glaciation, and ameliorating temperatures and increasing precipitation in the early Holocene (Brice 1978; Butzer 1978). Sediments at the head of the Persian Gulf suggest that after about 7000 B.C. a relatively arid period was followed by one marked by fluctuating precipitation but generally less aridity (Diester-Haas 1973; Sarnthein 1972). These Gulf sediments, representing deposits washed down from the Taurus and Zagros Mountains, also reflect a history of transgressions, standstills, and regressions in sea level, which began to rise at about 13,000 B.C. Sarnthein believes that sea level (as seen in the Gulf deposits) reached its present height at ca. 4000 B.C. (1972:260). He suggests that before that time, the Zagros rivers were less "active" than they are today, and that the climate in the Zagros was considerably drier than it is now. Although on the whole they are poorly dated, these Gulf sediments indicate that one of the earliest transgressions (which should represent a lessening of aridity and perhaps the beginning of a warming trend) occurred at about 10,000–9000 B.C.

This summary suggests that despite the interpretive problems that they raise, several independent sets of paleoclimatic data reflect a uniform if broad pattern. In very general terms, after about 10,000 B.C. there appears to have been a climatic change that is reflected in lacustrine and marine sediments and fauna, as well as terrestrial sediments and prehistoric pollen deposits. Details of the picture are

complex, probably variable interregionally, and somewhat problematical, but the pattern seems to involve gradual increases in temperature and effective moisture. Both the pollen profiles and the Gulf sediments reveal a series of fluctuations and reversals, particularly during the period between ca. 7000 and 4000 B.C. However, essentially modern temperature and precipitation ranges had been established by about 3500 B.C., and evidence suggests that floristic associations in the Zagros from that period on were much as they would be today if unmodified by human land use. Analyses of additional Zagros pollen cores and improved chronological control of all of the paleoclimatological data promise to improve our understanding of the vexed issue of relationships between climatic change and related transformations in patterns of human settlement and subsistence. Slight differences between the Mirabad and Zeribar pollen cores suggest that the southern and more northerly Zagros, and localities at different elevations and longitudes, had differing climatic histories. However, although such variations must have affected local land use, they may be insignificant in terms of larger-scale diachronic trends (Fisher 1978:40ff.).

Despite their limitations (McDonald 1979:89ff.), the combined data indicate that essentially modern conditions prevailed in the Kangavar area by about 5500 years ago. Regardless of whether oak or pistachio and almond dominated the arboreal component of the floral community in this particular part of western Iran, palynological and archaeological data suggest that by then the local agrarian population may have relied more heavily on domesticated species than on climax vegetation, and may have begun to alter the habitat. Features of the adaptation described in earlier chapters appear to have a long history.

PREHISTORIC LAND USE AND SETTLEMENT

Archaeological evidence from the Zagros shows that the changes in climate and vegetation outlined above were accompanied by changes in land use. The period between the tenth and fourth millennia saw two fundamental and closely related socioeconomic transformations: the development of internally differentiated settlement systems characterized by long-term occupation of built structures, and the increasing reliance on and control of a small group of plants and animals. Data from excavations and surveys in the central Iranian Zagros document these changes and indicate that by 3500 B.C. some of the formal features of modern village life had been established in the Kermanshah-Hamadan region. These data are briefly reviewed here to illustrate the development of patterns of subsistence and settlement seen in the Kangavar area today.⁹

⁹Late Pleistocene and early post-Pleistocene (Holocene) occupation in the Zagros has been discussed by a number of writers (Braidwood and Howe 1960; Flannery 1969; Hole n.d.; Hole and Flannery 1968; Mellaart 1975; Pullar 1977; Redman 1978; Singh 1974; Smith 1971; Smith and Young 1972; Young and Smith 1966). Much of the research on which the following section is based is as yet incompletely published.

TABLE 6.1
Sites and Samples: Selected Early Settlements in the Zagros-Taurus Mountains and Adjacent Areas

Site	Approximate date (B.C.) ^a	Approximate area		Percentage excavated ^b	Number of seasons	References
		Site (ha)	Excavated (m ²)			
Zawi Chemi Shanidar	ca. 8500	n.a. ^c	112	n.a.	2	Solecki, personal communication; 1981
Karim Shahrir	ca. 8000	.42	500	12	1	Braidwood and Howe 1960
M'lefaat	ca. 8000	1.10	60	.5	1	Braidwood and Howe 1960
Ganj Dareh	8000-6800	.13	310	24	5	P. E. L. Smith 1976; Hesse 1978
Ali Kosh	8000-6000	1.43	180	1.3	2	Hole <i>et al.</i> 1969
Cayonu	7500-6500	2.50	1300±	5	4	Redman 1978
Tepe Guran	6600-5500	.94	120	1.3	1	Meldgaard <i>et al.</i> 1964
Qal'at Jarmo	6500-5800	1.30	1370	10	3	Braidwood and Howe 1960
Chaghha Sefid	6500-5000	2.00	240	1	1	Hole 1977
Catal Huyuk	6500-5800	13.00	4050	3	4	Mellaart 1967; Todd 1976
Tepe Sarab	6000-5800	2.00± ^d	555+	2.8	2	McDonald 1979
Umm Dabaghiyah	ca. 5900	.85	3750±	44	4	Kirkbride 1975
Yarim Tepe I	5800-5000	.80	1740	22	7	Merpert and Munchaev 1973

Tell Hassuna	5800-5000	3.00	2550	9	2	Lloyd and Safar 1945
Matarrah	5800-5000	1.00	470	5	1	Braidwood <i>et al.</i> 1952
Tell es-Sawwan	5700-5000	2.50	2750	12	6	al-Sooif 1971; Yasin 1970
Tell Shimshara	5600-5000	2.00	400 ±	2	1	Mortensen 1970
Hacilar	5600-5000	1.50	3540	24	4	Mellaart 1970
Hajji Firuz	5500-5000	2.50	140	.6	2	Voigt 1976
Chogha Mami	5500-5000	5.00	1600 ±	5	1	Oates 1969
Tepe Gawra XX-XI	4500-3400	1.10	4065	36	5	Tobler 1950
Seh Gabi C	ca. 4200	.03	87	25	1	McDonald 1979
Dalma Tepe	4200-4000	.20	100	5	3	Hamlin 1975
Seh Gabi B	4100-3700	.96	410	4	2	Kramer [n.d.]a
Tall-i Bakun A	ca. 4000	2.00	1825	9	2	Langsdorf and McCown 1942
Seh Gabi E	3700-3500	.44	145	3	1	Kramer [n.d.]a
Seh Gabi A	3700-3500	.60	150	3	1	Kramer [n.d.]a

^a Dates are approximate, based on uncorrected 5730 half-life as reported in a range of publications. The abbreviation n.a. indicates data not available.

^b Oates (1977) lists areas and sample proportions for some of these sites; in some cases, her figures differ from those shown here. These are measures of area, not volume.

^c Rose Solecki (personal communication) indicates that the surface scatter of artifacts extended over several hectares, but it was impossible to estimate the original site area.

^d McDonald (1979: 216f.) notes that its greatest diameter is 150 m.

Table 6.1 lists some of the salient features of post-Pleistocene sites in the Zagros and adjoining areas. Many other sites have been found during surface surveys, and some have been explored with small trenches, but are not discussed here because for present purposes too little is known of their subsistence economy, structural remains, and spatial organization (Braidwood and Howe 1960; Levine and McDonald 1977; Mortensen 1975).

Terminal Pleistocene hunter-gatherers in the Zagros occupied caves, rockshelters and, as climate began to ameliorate after 9000 B.C., insubstantial structures in some open-air sites. Comparatively few Zagros settlements of the early post-Pleistocene have been described in detail, and the chronology, distribution, and internal organization of Zagros sites of the eleventh through eighth millennia remain to be fully documented. A number of archaeologists working in the central Zagros have noted that the evidence for early post-Pleistocene occupation is sparse, and the settlements generally quite small. This pattern may reflect sample bias resulting from the considerable alluviation already discussed, as well as recent disturbance and scattering of archaeological remains that were never very substantial or extensive. The evidence available suggests that villages in the eleventh through eighth millennia were not numerous, and that the first extensive year-round settlement of the central Zagros occurred during the late eighth and early seventh millennia. The publication of a number of surveys carried out in the Zagros should clarify the nature and chronology of settlement patterning during the first few millennia of the Holocene.

Apparently somewhat more recent than late Pleistocene occupations in the central Iranian Zagros (such as Warwasi, Pa Sangar, Ghar-i Khar, and Bisitun, all of which have terminal paleolithic [Zarzian] components), several open-air camps have been found on the Iraqi side of the Zagros. Among the sites in this group are Zawi Chemi Shanidar (Solecki 1981), Karim Shahir, and M'lefaat (Braidwood and Howe 1960). Probably occupied during the ninth millennium, these sites have yielded (little) botanical material, remains of a variety of wild animals, and artifact assemblages including small chipped stone tools as well as heavier chipped and ground stones. Some of these might have been used in clearing arboreal vegetation ("celts") and processing plant foods ("querns," "pestles," "mullers," and "mortars"). In addition to their zoological and artifactual remains, these sites have produced evidence of temporary facilities and/or structures in the form of pits and perhaps "pit-houses." With the possible exception of Zawi Chemi Shanidar (Solecki 1981:53), there is no clear evidence of tenth or ninth millennium architecture in the Zagros, where sites are thought to have been intermittently occupied on a seasonal basis. Although the botanical and faunal remains have not yet been sufficiently analyzed and/or published either to refute or substantiate such interpretations, Perkins and Daly (1974:80) suggest that by ca. 8500 B.C. sheep had been brought under the control of inhabitants of Zawi Chemi Shanidar.

Ganj Dareh is one of the earliest Zagros villages known. Situated between Kermanshah and Harsin (Figure 1.1), it was excavated between 1967 and 1974 by P. E. L. Smith of the University of Montreal; data analysis is well under way, and a number of preliminary reports have appeared. This small mound (approximately .13 ha in area) lies at an elevation of approximately 1400 m above sea level, in a small intermontane valley some 5 km from a branch of the Gamas-i Ab, the river draining the Kangavar valley to the north. The site is not far from Kuh-i Parau, in which the late Pleistocene cave sites Bisitun ("Hunter's Cave") and Ghar-i Khar are situated (Smith 1971), and where relict stands of oak and pistachio have been seen. Ganj Dareh lies in Zohary's deforested oak belt; Hesse (1978:20) refers to it as the border between oak forest and almond-pistachio savanna, and remains of pistachios were found at the site (McDonald 1979:506). In earlier reports, it had been stated that there were no other prehistoric sites in the "immediate neighborhood" (Smith 1968:158), but a recent survey has located some apparently contemporaneous sites within a day's walk of Ganj Dareh (Smith and Mortensen 1980).

In Ganj Dareh's phases D through B, sequent settlements of mud and mud-brick architecture were constructed above earlier remains apparently left by a more transient population. This earliest phase (E), presumably a series of temporary camps, was perhaps occupied during the late ninth or eighth millennium, and in some of its features resembles the Iraqi sites mentioned above. Particularly noteworthy are its shallow circular and oval pits, of varying sizes, sometimes filled with ash and burned stones; similar features are also reported at Tepe Abdul Hosein, near Nehavand (Pullar 1979), at the contemporary site of Tell Abu Hureyra in northern Syria (Moore 1979), and at the slightly later Turkish site of Cayonu (Redman 1978). Despite extensive use of flotation and sieving, comparatively little botanical material was retrieved from Ganj Dareh's phase E pits or from later deposits. Faunal remains, however, were abundant, and have been analyzed by Hesse (1978). In contrast to Zawi Chemi Shanidar, caprovids were extensively exploited, but they do not seem to have been "managed" during phase E. The avifauna and mortality curves for neonate caprovids suggest that the inhabitants of Ganj Dareh E were there during winter, spring, and early summer months; the site is located in the kind of terrain in which nursery herds of goat would have been found throughout the year (Hesse 1978:339). The absence of grinding stones in phase E could be taken to mean that reliance on plants was not as great as it was subsequently, perhaps in part because of the discontinuous, seasonal nature of occupation.

Ganj Dareh phases D through A date to the eighth and early seventh millennia. A variety of burials, clay objects, chipped and ground stone artifacts, clay storage containers, and bins were associated with a cluster of small, densely packed rectilinear rooms built of mud and mud bricks. The labyrinthine appearance conveyed by these structures is heightened by a dearth of streets and court-

yards, and the apparent absence of doorways in the tiny rooms excavated as of 1974. Although their walls were quite thin, some of these rooms may have been the lower levels of two-story structures (Smith 1976:15).¹⁰

The presence of edge sheen on chipped stone blades, and a range of grinding stones, bins, and large "storage vessels," in conjunction with an increasing frequency of bones of house mouse (a species attracted to stored plant foods), a few grains of emmer in the uppermost levels, and the use of chaff in bricks and some vessels, suggest that occupants of Ganj Dareh may have been increasingly dependent on plants, some of which may have been cultivated. Hearths and ovens in phases C, B, and A (and perhaps even the "firepits" in phase E) may have been used to parch grain as well as to burn lime. Regardless of whether grain was wild or cultivated, if it was stored at the site one might infer occupation during the seasons following harvest (i.e., fall if not also winter months).¹¹

In contrast to earlier occupants, the inhabitants of Ganj Dareh D, C, B, and A were probably herding goats and perhaps sheep as well. In the faunal sample, the number of immature males predominates over mature individuals, suggesting a butchering pattern like that seen in modern villages. Impressions of goats' (?) hoofprints have been found on a number of mud bricks excavated in phase D, and seem unlikely to represent tracks of totally wild animals. Caprovids far outnumber other species in the excavated sample, but many wild animals in the area were hunted, some probably for their furs and skins rather than for their meat.¹² Some avian species characteristically found primarily during summer months today (e.g., stork) are absent from the assemblage, but this need not mean that the site was unoccupied then. Many birds present in the Kangavar area today (including stork) are not exploited. At Ganj Dareh, birds may have been particularly sought after during colder months when other sources of meat were in short supply. Some of the avifauna found there do occupy the area year-round today, and may have been hunted throughout the year.¹³

The relatively small number of gazelles and onagers at Ganj Dareh may reflect the development of woodland conditions in the eighth and seventh millennia. Hesse suggests (1978:43ff.) that deer and onager found at earlier Kermanshah

¹⁰These walls sometimes have buttresses or pilasters. Comparably miniscule rooms are reported at a number of early villages (Watson 1978), and it may be that in some cases their size reflects the sparsity of arboreal vegetation and hence of beams.

¹¹P. E. L. Smith has suggested (1976:14) that acorns might have been a staple plant food; in Luristan today, acorns are ground into flour and consumed in some quantity (Hole 1978:147ff.; Stark 1936:85). Informants in Aliabad knew of this practice but said that they did not use acorns in this way; they did, however, use (purchased) oak bark for tanning goat skins. Both acorns and the pistachios reportedly found at Ganj Dareh would have been available in the fall.

¹²Hesse reports the presence of red deer, aurochs, hare, wild hog, red fox, jird (a rodent), and other mammals. Reptiles and invertebrates are present in small numbers (clams and snails, in particular, are rare in contrast with the quantities reported for Sarab and Jarmo).

¹³The Chukar partridge (*Alectoris*), one such year-round resident of the area, is the most abundant avian species at the site and is represented in enormous numbers (Hesse 1978:92).

area sites (e.g., Warwasi, Bisitun, and Ghar-i Khar) may reflect an “equid specialization” among late Pleistocene hunters; this may have been replaced by an increasing reliance on goats as climatic amelioration and increasing arboreal cover resulted in shrinking habitats for onager and gazelle, which prefer relatively open country. The occurrence of these species at the steppe and piedmont sites of Mureybit (Syria) and Ali Kosh (Iran) might support Hesse’s argument, as would the absence of onager at the nearby but somewhat later site of Tepe Guran and its presence at Umm Dabaghiyah (an Iraqi steppe site roughly contemporary with Guran). Ganj Dareh’s artifact assemblage is notably lacking in stone axes, celts, choppers, or picks, which could have been used in removal or processing of arboreal vegetation (Smith 1972:187). Perhaps the distribution of trees was limited to the higher ridges flanking the Harsin valley; if *Pistacia* was an important component of the arboreal community, this may have been more “woodland” than “forest.”

Available radiocarbon determinations suggest that Ganj Dareh spans the period between the occupations at Zawi Chemi Shanidar and Tepe Asiab, an aceramic site with some parallels to Zawi Chemi, with which it was at first considered contemporary (Braidwood *et al.* 1961:2008). Now thought to have been occupied from perhaps ca. 7100 to ca. 6700 B.C., Asiab is located in the Kermanshah valley, about 30 km west of Ganj Dareh and near the slightly later site of Sarab.¹⁴ It was excavated during the 1959–1960 season of a University of Chicago project led by R. J. Braidwood. Situated at an elevation of about 1350 m, Asiab is a small, low mound in which exploratory trenches revealed an ovoid semisubterranean structure with an estimated diameter of approximately 10 m (substantially larger than the “pits” referred to above), two burials, and a large associated collection of coprolites, artifacts, and faunal remains (Bökönyi 1977; Braidwood *et al.* 1961; Hesse 1978). Details of Asiab’s botanical remains are not yet available, but the site yielded blades with edge sheen and ground stone tools that may have been used in collecting and processing plants (Singh 1974:166f.). Many of the animal species reported at Ganj Dareh were also found at Asiab, but some of them present interpretive problems.¹⁵ According to Bökönyi (1977:36f.), the Asiab avifauna indicate that the site was occupied during fall, winter, and

¹⁴The sizes of Asiab and Sarab are not given in the preliminary reports, nor is it clear either how many sites were located during the 1959–1960 survey of the Kermanshah–Mahidasht area or how many of them are provisionally dated to the seventh millennium. It must be emphasized that at least some occupations dating to the eighth and seventh millennia are buried beneath alluvium, disturbed by more recent land use (literally, plowed away), or both. Tepe Abdul Hosein, a small site in Luristan, is probably contemporary with Tepe Asiab (Pullar 1981).

¹⁵At Asiab, the quantities of *Helix* (an edible land snail found in fairly considerable numbers in other post-Pleistocene Zagros sites) are small, although there is reportedly an abundance of freshwater clams (Braidwood *et al.* 1961:2008). And, as at Sarab, there is evidence for a range of small and larger mammals, most of them also found at Ganj Dareh, but also red deer, roe deer, onager, and gazelle (Bökönyi 1977:6f.). Remains of fallow deer, absent at the nearby site of Sarab, were also found at Asiab. More than half of the mammalian remains were caprovids, with goat far outnumbering sheep. Bökönyi considers the Asiab goat sample to include a few domesticates, but suggests that the sheep were entirely wild (1977:19ff.). Hesse argues that Asiab reflects a specialized goat-hunting adaptation

spring, and the juvenile mammalian fauna suggest occupation between February and August. Hesse (1978:339) thinks that this seventh millennium site may not have been occupied during summer months, when herds of wild male goats may not have been present in this part of the Kermanshah plain.

Located beside the Qara Su near Asiab, Tepe Sarab is a small mound at approximately 1300 m above sea level (McDonald 1979). The site was excavated in 1960 by a team directed by Braidwood (Braidwood *et al.* 1961) and in 1978 under the direction of L. D. Levine of the Royal Ontario Museum. Radiocarbon dates place Sarab in the early sixth millennium, and some Sarab ceramic types are paralleled in the upper levels at Tepe Guran, dated to ca. 5800 B.C. In many respects the Sarab artifactual assemblage is also similar to that of the contemporaneous Iraqi village of Jarmo (Hole 1961). However, in contrast to Jarmo, at which substantial mud architecture was exposed, excavations at Sarab have revealed only a complex array of oval, pitlike depressions, reportedly somewhat smaller than that at Asiab, and the remains of what may have been mud-plastered reed huts (Braidwood, personal communication; McDonald 1979:238; Singh 1974:167). Because of the apparent absence of mud architecture, Sarab was originally interpreted as a seasonally occupied site, and Braidwood and Mortensen suggested that it may have been an upland summer counterpart to Tepe Guran. Bökönyi's faunal analysis (1977) suggests that the site may have been occupied on a more permanent basis than was once thought, whereas later work suggests that Bökönyi's data derive from two components, and that Sarab's earlier occupation was seasonal in nature whereas its later deposits represent year-round occupation (McDonald 1979:253). Bökönyi's analysis of the mammals suggests a steppe habitat; the avifauna suggest to Jánossy (1977) an environment comparable to that of the present.¹⁶

Along with domesticated emmer wheat and barley, Sarab produced wild barley, pistachio nuts, and very large quantities of *Helix salomonica*, snails sometimes interpreted as reflecting a cool, moist climate (Hesse 1978:48). Sarab's pits may have served as food-storage facilities, and some of its ground stone objects were probably used in processing food (McDonald 1979:304). As at Tepe Guran, the presence of both wood (in structures) and pistachio nuts is noteworthy. The wood identifications have not yet been published, but the nuts would suggest the presence of *Pistacia* trees somewhere in the Kermanshah area, and thus support

(1978:337ff.); he minimizes the importance of morphological evidence discussed by Bökönyi and emphasizes the high percentage of adult males in the sample.

¹⁶Relative to the earlier site of Asiab, there is an increase in the proportion of gazelle, a decrease in red deer, more caprovids, and no fallow deer. The presence of the great bustard (*Otis*), a dry plains species, would seem to support Bökönyi's inference. The avifauna suggests that the site was occupied during fall, winter, and spring, and the caprovid age curve suggests a perennial occupation with perhaps a "particular emphasis" in February and March (Bökönyi 1977:36f.). The comparatively large number of partridges (*Alectoris*) found at Sarab suggests to Jánossy (1977), who identified the avian remains, that environmental conditions at about 6000 B.C. were much like those of today.

the reconstruction of the Zeribar core for this time range. In addition to the plant and animal remains found, Sarab yielded large numbers of clay figurines, including some clearly identifiable as boar, domestic sheep, and tortoise (Bökönyi 1977:25). Along with a wide range of hunted mammalian species, birds, and a few unidentified fish, the domesticated dog appears in the faunal collection (and seems on occasion to have constituted a part of the diet; Bökönyi 1977:34). The presence of periodontal disease in some of Sarab's goats may be related to seasonal stall-feeding on poorly threshed cereals (Bökönyi 1977:38). This interpretation might support the inference that at least one of Sarab's components was perennial and this, in turn, might support the argument that temperatures were ameliorating at this time.¹⁷

Although it is lacking in evidence of substantial structures usually associated with settlements termed villages, Sarab is contemporary with other sites in the central Iranian Zagros at which such remains have been found. Perhaps the best described of these is Tepe Guran, approximately 60 km south of Sarab. A small mound covering almost 1 ha, Guran lies about 140 m from the banks of the Jazman Rud, some 950 m above sea level in Luristan's Hulailan plain. (The Jazman Rud joins the Saimarreh, fed by the Qara Su, which drains the Kermanshah plain, and the Gamas-i Ab, draining the Kangavar, Harsin, and Nehavand areas. Together, as the Karkheh, they flow toward the Khuzistan lowlands and debouch in the Persian Gulf, whose post-Pleistocene sediments were discussed above.)

¹⁷Bökönyi, who analyzed the Sarab and Asiab fauna, believes that they contradict analyses of the Zeribar profile summarized above. His observation (1977:12f.) appears to be based partly on a misunderstanding of the palynological data, and partly on his assumptions about the niches of certain mammalian species. According to Bökönyi, the Asiab fauna suggest a parkland and forest-dominated association (including wild pig and red deer, for example), whereas the pollen suggests that during Asiab's occupation the climate was drier than the fauna would imply. Bökönyi also reports fallow deer (*Dama mesopotamica*), and although there appear to be no forest birds, there are also no bustards (*Otis*; see note 16). Sarab's higher proportion of gazelle, fewer red deer, more numerous caprovids, and *Otis* remains suggest drier conditions to Bökönyi. He notes that the Zeribar core suggests an increase in precipitation and temperatures during the period beginning at about 6000 B.C., whereas the fauna imply a change in the opposite direction (wet to dry). In attempting to explain this possible discrepancy between the Zeribar pollen and the Kermanshah paleofauna, Bökönyi suggests that the trend to wetter conditions may have begun slightly earlier in Kermanshah, which he apparently (mistakenly) thinks is wetter than the Zeribar area. He also suggests the interesting possibility that the domesticated goats at Sarab contributed to local deforestation (reflected at a somewhat later period in the Zeribar core), and adds that these animals may have been indirectly responsible for the opening up of agricultural fields. This postulated goat-induced deforestation may (according to Bökönyi) have extended the niche for sheep, which seem to have become more numerous in the period following Sarab's occupation. Hesse, who would accept the applicability of the Zeribar and Mirabad cores to paleoclimatic reconstructions for the Kermanshah area (provided those of Lalabad and Nilofar eventually prove to have similar spectra), points out that red deer has a wider range of habitats than simply "forest." Bökönyi uses red deer at Asiab to argue for wetter conditions in Kermanshah than in Zeribar; Hesse (1978) and Wright (1968) note that the species sometimes occupies steppe and mixed niches. Hesse also points out that there is oak charcoal at Palegawra, at somewhat lower elevations (990 m above sea level) and on the more westerly slopes of the Zagros, and suggests that (perhaps due to the location of storm tracks at that time) forestation began earlier in the west and moved eastward. Oak constitutes a large proportion of the wood identified at Jarmo, an Iraqi village site of the late seventh millennium, also situated in the western Zagros at about 750 m above sea level.

Preliminary reports on Tepe Guran have been published by its excavators (Meldgaard *et al.* 1964; see Mortensen 1972, 1974, 1976). A series of stratified settlements spans the period from ca. 6500 to ca. 5500 B.C.; typologically, its ceramics (absent in the earliest levels) have parallels at both Jarmo and Sarab. For perhaps only a portion of each year, the earliest inhabitants lived in what are interpreted as flimsy, freestanding wooden huts of two or three rooms each (Mortensen 1972:295). After about 6200 B.C. (Guran level P), more substantial structures of oval mud bricks were built; no plan has yet been published, but the rooms are described as “small” (Meldgaard *et al.* 1964:111) and the houses as “close together” (Mortensen 1972:295). At least one paved open courtyard was cleared (Meldgaard *et al.* 1964:112).

In one of Guran’s intramural ovens, remains of domesticated and some wild barley were found (Renfrew 1969:155f.); no wheat is reported from the site. Perhaps the chaff used to temper Guran’s pottery derives from barley grown and threshed near the site. As at Ganj Dareh and Sarab, pistachio nuts found at Guran suggest that by the mid-seventh millennium and later, *Pistacia* was well established in the central Iranian Zagros, perhaps at elevations ranging from 950 to 1350 m.¹⁸ Though chipped blades with edge sheen were rare in the earlier levels, these tools, many grinding stones, and a celt (or hoe; McDonald 1979:546; Meldgaard *et al.* 1964:119f.) imply the manipulation of local vegetation.

The Guran fauna is partially published.¹⁹ Preliminary comments by several authors indicate that domesticated goat is the most abundant mammal. Avifauna in the early levels suggest that Guran was occupied during the winter and perhaps abandoned for higher, better hunting grounds during summer months (Mortensen 1972:295). Sickle blades and grinding stones found at two other “neolithic” sites in Hulailan suggest that “some of the small valleys three to five kilometers west of the permanent villages were used for seasonal harvesting, perhaps of small stands of wild wheat and barley [Mortensen 1974:27].” It was probably to these local valleys, rather than up to the Kermanshah area, that the inhabitants of sites like Guran went; Mortensen has retracted an earlier suggestion that Sarab was a seasonal highland counterpart of Guran. During the later stages of its occupation, Guran appears to have been settled year-round. This was

¹⁸The wood used in its earliest buildings is not yet identified. Today, oak is found in the mountains surrounding Hulailan, and by this period it was apparently well established in the Jarmo area, approximately 270 km to the northwest.

¹⁹Animals found in some abundance include gazelle, hare, and fox. Sheep (some, in levels P–N, perhaps domesticated), aurochs, red deer, roe deer, wild pig, a variety of small mammals, *Helix*, and migratory winter fowl have all been reported (Hesse 1978; Mellaart 1975; Mortensen 1972). The migratory fowl are reportedly more abundant in Guran’s “semipermanent” basal levels, leading Mortensen to conclude (1972:295) that the earliest inhabitants wintered in the Hulailan plain and moved upland, in pursuit of wild herd animals, during the summer months. In overlying levels there is an increase in the bones of both gazelle and wild cattle; hunting of these large herbivores and of other animals, and collecting of land snails, appear to have increased during the period when Guran is thought to have been a permanent, year-round settlement.

presumably also the case at the Iraqi sites of Qal'at Jarmo (Braidwood and Howe 1960) and Tell Shimshara (Mortensen 1970), early villages that were partly contemporaneous with Guran, and with which its artifacts have some typological affinities (McDonald 1979:550f; Mortensen 1962, 1964). Tell Shimshara also has a (later) Hassunan component, and is in some respects comparable to Hajji Firuz, a site in Iranian Azerbaijan (Voigt 1976). At each of these sixth millennium sites, freestanding two- or three-room mud or mud-brick structures sheltered occupants subsisting on wild as well as domesticated plants and animals.

During 1959–1960, Braidwood's team explored a third site in the Kermanshah plain. Tepe Siahbid apparently dates to the fifth millennium, falling chronologically between Tepe Guran and Seh Gabi, to its east. Subsequent soundings by L. D. Levine suggest that Siahbid was a two-component site, with Sarab-like material underlying later Halaf-like "J ware" and Ubaid ceramics (Levine, personal communication; McDonald 1979:515). Bökönyi, who has published the fauna excavated in the first season, observes that the number of species exploited appears to have been far smaller than was the case at Asiab and Sarab.²⁰ Most of the mammals were domesticates, and Siahbid appears to have been occupied on a year-round basis (Bökönyi 1977:5,10,37). The reliance on caprovids may be reflected in spindle whorls, also found at other early villages. These whorls, as well as ceramics of both Dalma and Ubaid types, have some typological parallels at Seh Gabi, to the east of Kangavar, and at sites recorded during surveys of the Mahidasht–Kermanshah and Kangavar areas.

Of the known prehistoric sites in central western Iran, those closest to the modern village of Aliabad are the cluster of mounds collectively referred to as Seh Gabi. Seh Gabi is not only the most recent of the sites discussed to this point, it is also situated at the highest altitude: near the Khorramrud, a branch of the Gamas-i Ab, it lies between Kangavar and Tuyserkan at an elevation of approximately 1500 m. L. D. Levine, of the Royal Ontario Museum, directed the excavations in 1971 and 1973; radiocarbon determinations place the group in the period from ca. 4500 B.C. to ca. 3200 B.C. (Levine and McDonald 1977).²¹ Typologically, the material at the Seh Gabi mounds includes ceramics assigned to periods XI–VI at Godin Tepe, somewhat nearer Kangavar. Final analysis of the excavated materials and preparation of the final report are in progress, and several preliminary accounts have appeared (Hamlin 1973, 1974; McDonald 1979; Young and Levine 1974). Data on the botanical remains are not yet available; Heathcote (1974) developed a provisional list of fauna, tentatively identified

²⁰The Siahbid sample is very small, but it includes domesticated cattle, sheep, goat, and pig. Wild species include gazelle, red deer, onager, fox, and a few birds, among them one stork (Bökönyi 1977:6f.). The higher proportion of gazelle than red deer might suggest a predominantly steppic (late fifth millennium) habitat dotted with a few stands of forest (Bökönyi 1977:12).

²¹Louis D. Levine provided very helpful comments on an earlier draft of this section, but he bears no responsibility for any errors of fact or interpretation. McDonald (1979) refers to some slightly earlier ceramics at Mound C at Seh Gabi, but no associated discrete settlement or structure has been identified.

during 1973 (personal communication). Because Seh Gabi is the site nearest Aliabad and because the paleoenvironmental evidence summarized above suggests that its habitat may have been most comparable to that of the present, it is described in somewhat greater detail than the sites just discussed.

Mound C, the earliest settlement at Seh Gabi, yielded an assemblage now referred to as "Shahnabad" (Godin period XII) in the named sequence developed for the Godin-Seh Gabi project as a whole. With an area of approximately 350 m², Mound C was apparently occupied during the late fifth millennium B.C. (McDonald 1979:317ff.). Its ceramic and stone inventories are typologically different from those of the other mounds at the site and, on the basis of its pottery, Mound C was initially assumed to be even earlier in date than the radiocarbon determinations indicate (Levine and McDonald 1977:45). A small sounding produced well-preserved remains of two buildings, or groups of buildings sharing party-walls, on either side of a narrow alleyway and abutted by two larger open areas. Hearths, ovens, and small cubicles that may have been storage facilities were found in these multiroomed structures. Only one of the eight or more rooms fell entirely within the excavation area; measuring about 2.3 × 3 m in area, it may have been used for food preparation and/or storage. This room is within the size range of modern kitchens and storerooms at Aliabad, and most of the other Mound C rooms appear to have been somewhat larger, at least before they were internally subdivided in secondary building phases. Most of the walls in Mound C are less than 1 m in width, and there is no evidence of double walling; in the absence of evidence to the contrary, it may be assumed that these were one-story structures. Preliminary analysis of the faunal remains, which were comparatively less abundant than in the other Seh Gabi mounds, reflects the exploitation of various wild mammals and perhaps a few domesticated species.²² McDonald argues (on stratigraphic grounds) that the site was abandoned at intervals (1979:353), although the evidence does not point to repetitive, seasonal abandonments on an annual basis. In fact, the substantial structural remains and rebuilding suggest a labor investment which, in combination with the presence of domesticated pigs, implies a commitment to remain in one place for some time. Since domesticated cereals are widely reported from other sites in this time range, and since the assemblage includes grinding stones, sickles, and storage vessels, one assumes that the inhabitants of Mound C were agriculturalists for at least part of the year.

The earlier deposits of Mound B, the largest (.95 ha) of the Seh Gabi mounds, are assigned to the "Dalma" (Godin X) period and probably date to the end of the fifth millennium. No Dalma architecture was extensively cleared, but there is evidence of mud walling throughout the deposits, and it appears that sturdy

²²Heathcote's provisional identifications include wild boar, gazelle, red deer, various small carnivores, some juvenile cattle, sheep, goat, domesticated pig, and hare, turtle, and fish (see also McDonald 1979:474).

structures comparable to those of Mound C existed throughout the Dalma occupation. In the largest exposure, a series of pits and trash deposits lay in an unroofed area abutting a small, poorly preserved and thin-walled room measuring about 1×2.75 m. As in Mound C, the faunal remains include bones of red deer, perhaps reflecting the existence of wooded areas somewhere in the vicinity, and sheep and perhaps cattle were domesticated.²³ Flint blades with edge sheen again suggest the harvesting of cereals. Structural remains, rock-filled pits, trash, Dalma-type ceramics, and a variety of other artifacts found several meters beneath the current plain surface indicate that at about 4000 B.C. the valley floor was substantially lower than it is at present. Alluviation may be one cause of the failure of two surveys in the Kangavar area to locate remains unequivocally antedating the fifth millennium. However, a strong case can also be made for the comparatively late settlement of this area.

In several meters of deposit overlying the Dalma strata of Mound B and rising well above modern plain level, early fourth millennium Ubaid-related ceramics (of the "Seh Gabi," or Godin IX, period) were associated with well-preserved architecture and a range of artifacts. These include numerous flint blades with edge sheen, a wide variety of grinding stones, and ovate clay "sling missiles" perhaps used in hunting. At the top of Mound B, its most extensively cleared structures comprise a series of multiroomed brick buildings flanked by open areas (Young and Levine 1974:4ff.). In these upper levels, room sizes seem to have ranged from 1.5×1.5 m to 2×5 m; in a few cases, walls were almost 1 m thick, but most were about 50 cm wide. In one room, a feature with a small central depression surrounded by the remains of plastered "feet" was probably functionally, as well as formally, comparable to the modern hearths described in Chapter 4. Some fragmentary stone walls enclosed areas whose surfaces were unlike floors within the buildings, suggesting that the buildings were houses and the associated areas pens or stables (Young and Levine 1974:4ff.). Some rooms had been burned, repaired, and reoccupied. The burned areas contained charred wood and fragments provisionally identified as decomposed reed matting, perhaps used in roofing (as it often is today). The faunal assemblage included red deer as well as modern domesticates.

Two additional mounds at Seh Gabi, designated E and A, produced ceramics typologically comparable to those of period VII ("Hoseinabad") at Godin Tepe (Young 1969; Young and Levine 1974), and probably dating to the early to mid-fourth millennium B.C. The architectural remains of Mound A are in a far better state of preservation than those of Mound E, a low mound some .44 ha in extent. The excavations on Mound E exposed a group of rooms, two of them with a cruciform hearth, abutting an open area, apparently a courtyard or plaza,

²³Heathcote's tentative identifications of Mound B's Dalma component fauna also include some carnivores, many juvenile cattle, many juvenile as well as mature sheep, and some freshwater clams.

in which there was a poorly preserved bin and some grinding equipment. Room sizes appear to be in the range of 2×4 m, and the walls are up to approximately .5 m in thickness. As in the upper portions of Mound B, there is considerable structural evidence of remodeling and refurbishing, including some replastering. The buildings of Mound E were probably contemporaneous with the very well-preserved structures cleared in excavations on Mound A, which is approximately .6 ha in area. Two multiroomed structures, one of them flanked by or enclosing a stone-paved courtyard, abutted one another. Several of their walls exceed 1 m in thickness, and one structure had three stories. Ranging in size from about 2.5×2.5 m to 4.5×5.5 m, their rooms revealed considerable evidence of domestic activity in the form of bins, plastered pits, cruciform hearths, grinding stones, flint cores and chipped stone tools, bone awls, ceramics, spindle whorls, and faunal remains. These include domesticated dog, pig, and sheep, as well as some cattle and gazelle.

Because the botanical and faunal materials from Seh Gabi are not yet completely analyzed, it cannot be demonstrated conclusively that any one of its components was occupied year-round.²⁴ On the other hand, its architectural remains are among the most substantial of the early west Iranian villages reported to date, and they show evidence of continuity, maintenance, and investment in the form of reconstruction, replastering, and internal reorganization. Although there is no irrefutable evidence for either interior stables or interior courtyards, the buildings of Seh Gabi resemble those seen in the area today in several respects (e.g., construction materials and techniques, room sizes, abutting multiple-roomed structures, multiple stories, intramural storage facilities, hearths, and ovens). Seh Gabi's architecture incorporated wooden beams; generic identifications of the wood are not yet in hand, but the size of the beam holes preserved on Mound A and the room widths in all the mounds are generally comparable to those found in Aliabad village today, and suggest the use of fairly slender, short poles like those made from poplars. The occurrence of intramural hearths in all the Seh Gabi mounds might imply winter occupation, and the built-in storage facilities suggest occupation following a late summer or early fall harvest during which plant foods were stored and from which they were drawn as required. This reasoning leads to a tentative reconstruction involving year-round occupation since, at this comparatively high elevation, seasonal "abandonment" would most likely have occurred during the cold winter months. (Today, nomadic pastoralists bring their flocks to the Kermanshah–Hamadan uplands in summer, when their winter pastures in the lowlands are desiccated. By October, they have left for warmer and greener pastures at lower elevations.)

²⁴Heathcote (1974) does not discuss avian remains, which might be informative in this regard. Perhaps some of the clay "sling missiles" were used in hunting birds. (In Kangavar today, slingshots are used—with stones—to hunt small birds.) A number of rodents and other small mammals, and some *Helix* shells, were recovered in the excavations at Seh Gabi, and should eventually prove useful in paleoenvironmental reconstructions.

There is evidence of local production of stone tools, copper, and pottery. Spindle whorls reflect the processing of wool and/or hair, presumably largely from domesticated goats and sheep (see Levine 1977). The small number of chipped stone artifacts which may be interpreted as projectiles and the apparently small proportion of wild animal species relative to domesticates may point to a heavier emphasis on stockbreeding than on hunting. The number of blades with edge sheen, the number and variety of grinding implements, the presence of chaff temper in pottery, the occurrence of features interpreted as storage bins, and the presence of house mice might, taken together, reflect a considerable (though not necessarily exclusive) reliance on cereal crops and legumes.

Very few of Seh Gabi's stone artifacts can plausibly be interpreted as having been used in forest clearance, woodworking, or field preparation (Smith and Young 1972). There are no celts and very few "plane"-like implements, and none of the stone "hoes" found at sites of the same time range in the more southerly alluvium (Voigt 1976:743ff.), although there are a few doughnut-like stone objects that might have served either as loom weights or digging-stick weights. These apparent absences could of course result from sample bias (see Table 6.1), but might also reflect a habitat that was not heavily forested. It is not clear whether the mid-fourth millennium occupants of Seh Gabi were surrounded by oak forest or, as seems more likely, by a more open savanna-woodland including oak, pistachio, and almond trees. The Zeribar pollen core and the other paleoenvironmental sources discussed above indicate that botanical associations in the Iranian Zagros were essentially like climax vegetation of the present by the time Seh Gabi was occupied. However, trees (particularly oak) might have been limited to higher elevations above the valley floors; alluvial areas were at least partly devoted to cultivation, although there were probably some trees in riparian niches at lower elevations.

Cooking and heating along with the processing of copper in Godin VII times and the manufacture of ceramics in all periods would have necessitated the use of some form of fuel, which could have consisted of brush or of dung cakes as well as wood obtained either locally or at some distance from the site. Should the provisional field identifications prove accurate, the earlier occurrence of red deer and the later occurrence of gazelle might suggest a gradual diminution of climax forest or woodland during the second half of the fourth millennium. The absence of stone hoes at Seh Gabi and in the slightly later occupation (period VI-V) at Godin Tepe might imply the use of wooden hoes. However, the use of plows by the early fourth millennium is also suggested by the widespread distribution of domesticated cattle (including some at Seh Gabi) and by plow marks excavated at the Susa A site KS-102 in Khuzistan (Wright *et al.* 1980). It may be that by ca. 3500 B.C. climax arboreal vegetation was already being modified by exploitative techniques in the Kangavar area. Although more information is required to prove the point, it is suggested that archaeological data support the botanical and

geological evidence, outlined above, that essentially modern environmental conditions have prevailed in this area for nearly 6000 years.²⁵

To the south of Seh Gabi, not far from Kangavar, is the large site called Godin Tepe. The 1965–1973 work at Godin was directed by T. Cuyler Young, Jr., and has been described in several articles and two lengthy preliminary reports (Young 1969; Young and Levine 1974). The earliest levels at Godin appear to be contemporaneous with some of the components at Seh Gabi, but they were overlain by too much later material to permit extensive excavation. Its earliest historic components (periods VI–V, IV, and III) postdate Seh Gabi, spanning the period ca. 3500–ca. 1300 B.C. Godin V is of greatest interest in the present context because it demonstrates that by the late fourth millennium, at least some settlements in the Kangavar area were substantially larger and organizationally more complex than the early villages discussed above (Weiss and Young 1975). The extent to which Godin V and later components are comparable to small-scale rural settlements in the same region is not yet entirely clear; formally, there are some differences, and its architecture and artifacts suggest that Godin in the late fourth millennium and thereafter is probably more accurately described as a “center” than as a “village.”

Reduced in size by erosion, Godin Tepe today covers approximately 14 ha. Artifacts and architecture exposed in two large trenches suggest that the Godin V settlement was well over 1 ha, and may have been as large as 7 ha (Weiss and Young 1975:2). The layout of the Godin V walled “citadel” is unusual among known settlements of this early time range. A curvilinear wall encloses a structure interpreted as a public building, and it is surrounded by a lower town with “simple village houses built by prosperous peasants” who continued to use ceramics of Godin VI type (Weiss and Young 1975:5). Its artifacts suggest that the citadel area may have been an economic and administrative center, and there is some evidence that during this period of early state formation it was controlled if not populated by merchants from Khuzistan. Along with its unusual features, Godin VI–V also has parallels with modern settlements in the area. The dimensions of rooms, the arrangement of at least some rooms around a central courtyard, architectural details such as niches and hearths, evidence of rebuilding and later filling in of open spaces, construction techniques and, of course, intrasettlement variability are all seen in the Kangavar area today. As at the earlier Seh Gabi mounds, adult burials are virtually nonexistent in the sampled areas, suggesting that, as in more recent periods, there may have been a cemetery at some remove from the settlement.

The Godin V settlement yielded abundant evidence of both the storage and processing of plants, although the assemblage has no stone hoes and there is

²⁵This generalization ignores the brief recent period represented by the Khorramabad Alluvium and a comparable set of deposits in the Gulf (Diester-Haas 1973; Vita-Finzi 1969).

nothing clearly suggesting woodworking. Botanical remains include wheat, barley, and peas, and the use of considerable quantities of wood for building and perhaps also for fuel is suggested by evidence of metalworking, as well as by charcoal and some massive charred beams. The Godin faunal remains include wild species as well as domesticated cattle, pig, sheep, and goat, and one or more equid (Gilbert 1979).²⁶

In sum, the archaeological data reviewed to this point suggest that by the end of the fourth millennium, a number of features seen today were established in central western Iran, among them variation in sites' sizes and functions and internal differentiation of settlements' houses and presumably therefore social units. Evidence from early historic sites elsewhere in the Middle East suggests that by the time the Godin V citadel was abandoned, complex administrative institutions and socioeconomic inequalities were well developed. Archaeological and documentary materials from many contexts suggest that despite local variations many of the features of resource utilization and settlement pattern seen today extend from the prehistoric period into the subsequent third and second millennia; these later periods are not considered here (see Adams 1965, 1981; Adams and Nissen 1972; Redman 1978).

A heavy reliance on a small group of domesticated plants and animals is one of the features of modern life with substantial time depth. Because comparatively little of the botanical and faunal material from prehistoric villages in the central Iranian Zagros has yet been published, Table 6.2 must be viewed as incomplete. The available data suggest that the chief modern domesticates were not introduced into the subsistence repertoire simultaneously. In the case of livestock, data from central western Iran seem to reflect a sequence in which domestication of goats preceded that of sheep; these caprovids were followed by dog and pig and, by the late fifth or early fourth millennium, by cattle. Hesse (1978:41) has suggested that goat may have been domesticated in the southern Zagros, and sheep in the northern part of the area; wild forms of both species occur in the mountains today. The introduction of domesticated cattle may be related to the development of plow agriculture; wild cattle existed in the area during the Pleistocene, but domesticated cattle may have been introduced from elsewhere. The history of plant domestication in this area is somewhat clearer for the key cereals than it is for legumes or fruits, for which archaeological data in this early time range are rather scanty (Zohary and Hopf 1973; Zohary and Spiegel-Roy

²⁶Allan Gilbert has kindly described the Godin fauna to me. There are clearly identifiable horses in Godin III deposits, as well as both red deer and gazelle. Domesticated dog is found in both Godin III and IV, and Gilbert (personal communication) attributes its absence in Godin VI/V to sample bias. There are, in various strata, a few bones of a small number of wild mammalian species (e.g., red fox, bear, badger, beaver, hare, sheep, goat, and cattle) as well as birds and domesticated cattle and caprovids (Gilbert, personal communication). Gilbert notes that the major excavated areas appear to be at the center of the settlement, and that this has no doubt limited the number and distribution of faunal remains, perhaps giving us an incomplete and biased view of the diet of the ancient Godinis.

TABLE 6.2
Evidence for Selected Domesticated Plants and Animals, Early Village Sites, Zagros Area (ca. 7500–3500 B.C.)^a

Site	Plants						Animals				References
	Emmer	Einkorn	Barley	Lentil	Pea	Goat	Sheep	Pig	Dog	Cattle	
Godin V	+	+	+		+	+	+	+	+	+	Gilbert 1979; Weiss and Young 1975
Tell Chragh	+		+	+							Zeder n.d.
Seh Gabi ^b						+	+	+	+	+	Heathcote 1974
Bagh-i No	+		+								McDonald 1979; Zeder n.d.
Dehsavar						+	+	+		+	Bökönyi 1977
Siabid						+	+	+	+	+	Bökönyi 1977
Tepe Sabz	+		+	+	+	+	+		+	+	Harlan 1976; Hole <i>et al.</i> 1969
Chogha Mami	+	+	+	+	+	+	+	+	+	+	Oates and Oates 1976b; Zeder n.d.
Haji Firuz	+		+	+		+	+	+	+		Voigt 1977

Sarab	+		+	+	+	+	+	Bökönyi 1977; Mellaart 1975
Jarmo	+	+		+	+	+	+	Braidwood and Howe 1960; Harlan 1976
Tepe Guran								Harlan 1976; Redman 1978
Asiab								Bökönyi 1977
Chagha Sefid	+					+		Hole 1977; Wheeler n.d.
Ali Kosh ^c	+	+		+	+	+	+	Harlan 1976; Zeder n.d.
Ali Kosh ^d	+	+	+	+	+	+	+	Hole <i>et al.</i> 1969
Ganj Dareh	+							Harlan 1976; Hole <i>et al.</i> 1969
								Hesse 1978; McDonald 1979

^a A plus indicates the presence of the species; a blank space means either that the species is absent or that data are not yet analyzed or published. No distinction is made here between two-row and six-row barley.

^b Mound C through Godin VII; ca. 4200–3400 B.C.

^c Ali Kosh phase.

^d Bus Mordeh phase.

1975).²⁷ In the central Zagros, it appears that emmer is the earliest form of domesticated wheat; einkorn, perhaps a more abundant native in the area, appears, domesticated, at a slightly later date, and bread wheat is later still. Barley has a long history, but it is not clear whether it has always been a major food for humans; in general, more information on fodder crops would be useful, and should illuminate changing relations between people and livestock, and associated modifications in land use systems.

In combination, the archaeological remains of plants and animals imply that although climax plant communities like those of the present may not yet have been established, some of the most significant economic species were already exploited within the central Zagros by about 5000 B.C. Until the botanical and faunal remains found at individual sites are more fully described, it will not be feasible to develop detailed economic reconstructions for individual sites (Voigt 1976, 1977), to specify that a given site was occupied year-round or only in particular seasons, or to formulate detailed comparisons of sites and regions. Limited survey data and some excavations not yet discussed here do suggest that even before fully modern climate and floristic associations were established in the central Iranian Zagros, populations occupied settlements of varying size and function in a range of habitats. We may therefore turn from the local level (individual excavated sites) to consider some of the available survey data for this area. These data permit the tentative reconstruction of settlement patterning on a larger scale. Like the excavated material, they suggest that some of the features observed in the central Zagros today were well established by the late fourth millennium.

SURFACE RECONNAISSANCE IN CENTRAL WESTERN IRAN

During the past two decades, considerable surface reconnaissance has been carried out in the central Iranian Zagros. The general pattern emerging from this work suggests that there were few and small early (aceramic) Holocene sites, a gradual increase in the number of contemporaneous settlements as well as changes in site locations that were probably related in part to changes in land use strategies, a gradual increase in site sizes coupled with the development of site

²⁷This is not a study of the causes and circumstances of plant and animal domestication, a crucial topic which it is not feasible to pursue here. Hesse (1978), among others, discusses some hypothetical relationships between Zagrosian Holocene climatic changes and the domestication of sheep and goat. At present, perhaps the most extensively published information regarding "neolithic" plant and animal utilization in the greater Zagros area comes from Deh Luran, a region sufficiently unlike the central uplands to be excluded from the present discussion; for descriptive details, the reader is referred to Flannery (1969), Hole *et al.* (1969), and Hole (1978). It must be emphasized that the absence of particular species is in some cases probably attributable to the failure to use appropriate retrieval techniques, such as sieving and flotation, but in other cases it is due to the nature of soil

size hierarchies by the fourth millennium B.C., and less intensive land use and lower regional population densities in the prehistoric period than at present. These observations are perhaps best supported by a brief review of some of the surveys in areas near Aliabad. Because much of this work remains to be published in detail, the following observations are subject to modification in future.

The area immediately surrounding Aliabad has been surveyed twice by T. Cuyler Young, Jr., who covered large tracts both before (in 1961) and following (in 1974) excavations at Godin and Seh Gabi. He and P. E. L. Smith located Ganj Dareh in their survey of portions of the area between Kangavar and Kermanshah (Young and Smith 1966). The area between Ganj Dareh and Hulailan, in Luristan, was surveyed (in 1977) by Smith and P. Mortensen, whose findings included several additional early Holocene sites (Smith and Mortensen 1980). This survey followed Mortensen's earlier work (in 1973 and 1974) in Hulailan, after the test excavations at Tepe Guran had been completed. The Kermanshah-Mahidasht area was surveyed during 1959-1960 by R. J. Braidwood and his associates, and by a team led (in 1975 and 1978) by L. D. Levine. Following survey and soundings in the Kermanshah area, some of Braidwood's associates extended their search for early village sites to the south and southeast, surveying highland valleys in Luristan during 1961 and moving down the Zagros to the foothills of Khuzistan, where they found the now well-known Holocene site Ali Kosh, in the Deh Luran area (Hole 1962; Hole *et al.* 1969). Much of this and other survey work in the Iranian Zagros, and results of excavations at some of the early villages located in those surveys, have been summarized by Hole (n.d.) and by McDonald (1979) and need not be discussed in detail here.

Young's 1961 survey covered the Asadabad, Kangavar, Sahneh, Nehavand, Khorramabad, and Borujerd valleys. At some sites, Young found ceramics bearing typological resemblances to those found at Sarab and Guran (Young 1966:233), but materials of this early range were not found in the Kangavar area then or in his subsequent survey, although it is possible that some early sites have been buried by the Khorramabad Alluvium. It is also possible that, at an elevation of about 1500 m, the Kangavar valley was somewhat inhospitable until the Holocene climatic amelioration brought with it stands of edible cereals and nuts, and fuel associated with the climax arboreal association. McDonald (1979) has argued that because the Kangavar area is generally cooler, drier, higher, and

matrices, such as the clays found at Hajji Firuz (Voigt 1976); to the vagaries of archaeological sampling tactics; or to the taphonomic processes, including disposal practices, bringing together elements of burial assemblages (see Behrensmeyer and Hill 1980). Despite the fairly rapid genetic changes reflected in morphological transformations associated with some species' domestication, it must be noted that this discussion focuses on the period of such change, when problems inherent in evaluating morphology are perhaps greatest, and it is difficult to be sure that plants' and animals' behavior corresponded with their physical remains (e.g., "wild," "semidomesticated," "domesticated," and so forth). For general discussions and bibliography, see Reed (1976) and Ucko and Dimbleby (1969).

TABLE 6.3
Archaeological and Modern Settlements, Kangavar Area^a

Period	Approximate date	Number of sites	Population estimate ^b	Estimated sustaining area ^c (ha)	Hectares per site ^d	Distances between sites (km)		Nearest-neighbor statistic (R)
						Mean	Median	
Modern	A.D. 1966	41 ^e	15,086	ca. 15,000	825	2	1	1.3 (z = 3.65)
Godin V	3200–3000 B.C.	1	700–1400	350–2800	38,820	f	f	f
Godin VI	3500–3200 B.C.	20	2000–4000	1000–8000	1,690	2	1	.91 (z = -.77)
Godin VII	3700–3500 B.C.	11	1000–2200	550–4400	3,075	4.5	3	1.5 (z = 3.26)
Godin IX	3900–3700 B.C.	6	350–700	175–1400	6,470	2.3	2.3	.6 (z = -1.88)
Godin X	4100–3900 B.C.	6	390–780	195–1560	6,470	2.4	1	.6 (z = -1.88)

^a Modern data are drawn from the publications of the 1966 census; the portion of the Kangavar survey data tabulated here is described by Young (1975a, 1975b, 1977; personal communication). Dates are uncalibrated and are taken from Levine and McDonald (1977).

^b Population estimates are based on estimators of 100 and 200 persons per hectare of settlement area (see Chapter 5).

^c Sustaining area is estimated by using a low of .5 ha per capita and a high of 2 ha; the modern figure is based on gazetteer data.

^d The number of hectares available (potentially) for each site is obtained by dividing the total area of approximately 400 km² by the number of settlements for each period. Not all of this hectareage is either good arable land or good pasture.

^e If the town of Kangavar were added to these 41 villages, the total population supported by the area (of 38,820 ha) would be 24,500.

^f Because there is only 1 site, these statistics cannot be computed.

topographically more fragmented, it may not have been occupied on any long-term basis for the millennium following settlement of more congenial areas to the west. (This suggests to Young [personal communication] the possibility that some of the ceramics in his 1961 survey may date to Godin VII times rather than to the sixth or seventh millennia.)

In his 1974 Kangavar survey, Young located a total of 168 archaeological sites²⁸ in an area of approximately 1000 km². Each of these sites has been assigned to one or more cultural phases defined on the basis of excavations at three sites in the Kangavar area: Kangavar itself (including the Anahita Temple and precinct, excavated by S. Kambakhsh-Fard of the Iranian Centre for Archaeological Research and dated to historic periods), Godin Tepe (late prehistoric and early historic periods; see Young [1969] and Young and Levine [1974]), and Seh Gabi (prehistoric periods). Sixty-six of the sites recorded by Young in his 1974 resurvey were occupied during one or more of the cultural periods antedating 3000 B.C. Unpublished information provided by Young indicates that almost 400 km² of his survey falls in the southwestern portion of the area shown in Figure 5.1, and it is to this portion of his sample that the following observations and Table 6.3 refer.

The two earliest periods in the Godin sequence, XII ("Shahnabad") and XI ("Kucheh"), are represented at one site each, Seh Gabi (Mound C) and Godin respectively. In an area of about 400 km², the populations of these two sites cannot have been crowded, since even if each site was as large as 1 ha (which they apparently were not) and had a population of 200 people, the regional density would have been .5 person per square kilometer (in contrast with today's of either 38 or 61 per square kilometer, depending on whether Kangavar's population is omitted or included). Young's survey data suggest a comparable pattern in subsequent periods.

Godin X ("Dalma") artifacts were found at 20 sites in the Kangavar area. Three of these late fifth millennium sites are situated at elevations between the 1524 and 2134 m contours, and the remainder appear to have been lower, located either along the tributaries of the Gamas-i Ab or in the alluvial plain to the southeast of the Khorramrud. Young indicates (1975a:24) that sites of this period are all less than 1 ha in area; together, the Dalma sites cover a total of 13 ha, or an average of about .65 ha each. Six of Young's Dalma sites fall in the southwestern portion of the area shown in Figure 5.1. They are separated from

²⁸I am grateful to T. Cuyler Young, Jr. for comments on an earlier draft of this section and for his exceptional generosity in providing me with both a copy of his survey map and a list of the early sites referred to below. Using his map, I consulted the 1966 census and gazetteer to obtain modern population figures for the survey area, whose borders seem to enclose an area of about 750–800 km². Areal data for many of the 89 modern villages within this area are not available to me, although 37 of the 41 villages listed in Table 5.2 do fall within Young's 1974 survey area. Young has published some preliminary comments on sites' areas, and will provide additional detail in his final report. Any errors that I may have made in analyzing or describing his data must not, of course, be attributed to him.

one another by a mean distance of 2.4 km, and their distribution is slightly aggregated. Only one of the six sites is at an elevation above 1524 m, and two "pairs" of sites set very close together are located fairly near the river. Using an average site area of .65 ha, and population estimators of 100 and 200 persons per hectare of site area, one can suggest an aggregate population at these six Godin X sites ranging from 390 to about 780. If each person required as little as .5 ha/year to as much as 2 ha of arable land, one might estimate sustaining areas ranging from a low of about 195 to a high of 1560 ha for the valley's population, or as much as about 10% of the total hectareage used by the present-day population.

In the succeeding period, Godin IX ("Seh Gabi," dated to about 3800 B.C.), the pattern of settlement was broadly comparable to that of Godin X. Most of the 17 sites found by Young are situated near watercourses, and only one is above the 1524 m contour. None of the Godin IX sites exceeds 1 ha in area, and the total settlement area of 10 ha implies a mean site size of about .59 ha. Six of the 17 Godin IX sites found by Young fall in the area under consideration here. Mean distance between them is 2.3 km, and they are slightly clustered. This aggregation is most apparent in a group of three very closely spaced sites in the northern portion of Young's survey area, not far from Aliabad. The three sites to the south, lying east of Kangavar, are more widely spaced, at regular intervals of almost 4 km. All of the Godin IX sites in this 400 km² area are at elevations below 1524 m. Again using density estimators of 100 and 200 persons per hectare, a range of regional population figures from approximately 350 to 700 can be suggested. With a possible sustaining area ranging from .5 ha/year to 2 ha/year, the inhabitants of the six sites may have used anywhere from about 175 ha to as much as 1400, or less than one-tenth the arable land used today. As in Godin X times, there is no evidence for more than one settlement size class (Young 1975a, 1977).

Some interesting changes in settlement pattern appear to have occurred in the Kangavar area in the early fourth millennium.²⁹ Young located a total of 23 Godin VII sites, 11 of them located in the area considered here. These Godin VII ("Hoseinabad") sites, provisionally dated to the period ca. 3700–3500 B.C., are at greater distances from one another (about 4.5 km, on average) than were the earlier sites; they are less clustered than previously. Of the 11 Godin VII sites in the 400 km² discussed here, 6 are adjacent to a river, and 3 are at elevations higher than 1524 m. Aside from the linear distribution along the river, there is no evidence of either linearity or pairing. Most of these sites are less than 1 ha in area; they reportedly range from about one-third of a hectare to approximately 2 ha (Young, personal communication). One Godin VII site south of the area shown in Figure 5.1 is roughly 4 ha in extent, suggesting that a two-tiered size

²⁹Young's failure to locate any sites besides Godin Tepe with surface sherds of its period VIII ("Taherabad") might suggest that this phase should be reevaluated. Godin VIII may prove to be one component of one of the more abundantly documented ceramic assemblages (IX or VII) at Godin and Seh Gabi (Young 1975a:25); on the other hand, it may ultimately retain its status as a "real" period (L. D. Levine, personal communication).

hierarchy may have developed in the Kangavar area by the mid-fourth millennium. Using the figures applied in estimates for the earlier periods, regional population may have ranged from perhaps 1000 to 2200, and been supported by from about 550 ha to as much as 4400 ha (less than one-third the hectareage used by today's rural population in the same area).

The development of a site size (area) hierarchy suggested by Young's Godin VII survey data is clearer in the succeeding phase, Godin VI ("Cheshmeh Nush"), dated to ca. 3500–3200 B.C. Young found a total of 39 sites, covering an aggregate area of 29 ha, almost a doubling of the Godin VII settlement area. Two of the 39 sites are in the 2–5 ha range. Several of the new sites are east of Kangavar, and there is also a new group of sites on the alluvium to the north and west of Aliabad. As in earlier periods, some of these sites are located at elevations above 1524 m, including 5 of the 20 Godin VI sites in that portion of Young's survey area overlapping the area shown in Figure 5.1. Mean distance between these sites approximates that of the present, but because some sites are arrayed in tight clusters, median distance between pairs of sites is less. Making the conservative operational assumption that the two largest sites mentioned by Young are beyond the area in Figure 5.1, we can again generate estimates for settled population and sustaining areas. If all sites were about 1 ha³⁰ in extent, population may have ranged from 2000 to 4000, supported by from 1000 to 8000 ha. With a high estimator of 200 persons per hectare of settlement, and an assumption of the substantial figure of 2 ha per person, maximum sustaining area required for this 400 km² area in Godin VI times would have been just over half that supporting the modern population.

Young has noted an increasingly linear distribution of sites in these early periods. Linear distributions are often thought to be associated with canal irrigation. If canal irrigation was practiced by Godin VI times, it is possible that yields had been increased and fallowing periods shortened, perhaps permitting the production of "surpluses." Causal relationships between demographic changes (suggested by the increase in number of sites), changes in land use practices (suggested by changes in site distributions), and the development of a (three-tier?) site size hierarchy (suggesting changing political organization) are not the focus of this chapter. However, the Kangavar survey data suggest that such relationships might be further investigated with additional data for this time range, which antedates by several centuries the Uruk (Godin V) period, often referred to as that of the earliest pristine states (Johnson 1973, 1975, 1980).

The results of surveys elsewhere in central western Iran can be briefly outlined here for comparative purposes (Table 6.4). To the west of Kangavar, Levine has

³⁰If each of the two large sites were, say, 3.5 ha, a total of 22 ha would be distributed among the remaining 37 sites, yielding a mean site size of .59 ha. This would not represent a marked increase in the size of most sites over that of earlier periods.

TABLE 6.4
Modern Settlement in Survey Areas, Central Western Iran

Survey area	Number of sites	Approximate area (km ²)	Number of modern villages	Total village population	Village population		Rural density	References
					Mean	Median		
Kangavar ^a	168	1000	89	32,382	364	271	32/km ²	Young 1975a, 1975b, 1977, personal communication; gazetteer
Bisitun-Harsin ^b	n.a.	80	29	5,487	189	143	69/km ²	Gazetteer
Hulailan ^c	98±	80	10	2,989	299	235	37/km ²	Mortensen 1974; gazetteer
Mahidasht ^d	950	1700	265	44,525	168	138	26/km ²	Levine 1974, 1976, personal communication; Levine and McDonald 1977; gazetteer

^a The population of the town of Kangavar is not included. If the survey area is 750 km² (see note 28), the regional rural population density could be as high as 43 persons per square kilometer.

^b The survey area is estimated; Harsin town is not included; n.a. indicates data not available.

^c The survey area shown here is only a portion of the Hulailan plain, which reportedly has a total of about 30 villages. Figures given here refer to villages in the 1973 survey area illustrated by Mortensen (1974).

^d Mahidasht and Kermanshah towns are not included here (for these as well as Kangavar and Harsin, see Table 5.6). Levine (personal communication) notes that this survey area may be biased, since a decision was made (in 1975) to explore the relatively underpopulated areas east of Kermanshah rather fully, leaving more heavily populated areas for future work. Figures shown here for modern population (and density) may be somewhat lower than areas to the west.

surveyed in the Kermanshah–Mahidasht area (referred to as Mahidasht). As was the case in Young's work to the east, Levine's primary interest has been in locating Holocene rather than Pleistocene sites. After two seasons' work, his team has located some 950 sites in an area of approximately 1700 km², generally at slightly lower elevations than those characteristic of the Kangavar survey area. Sedentary occupation in this area may have occurred slightly earlier than in Kangavar; the earliest sites found in Levine's survey have Sarab-like pottery, not yet found in the Kangavar area although it is reported to the southeast near Malayer (Howell 1979).³¹ The next well-represented period in Mahidasht is characterized by so-called J ware, a pottery type in some respects comparable to Mesopotamian Halaf ware. Levine and McDonald (1977:44) provisionally date J ware to the fifth millennium, thus suggesting that it may be at least partly contemporaneous with periods XII–XI in the Godin sequence. The 61 J ware sites are almost all located on seasonal or permanent streams, and about one-fifth of them are on slopes above the valley floor (Levine and McDonald 1977:49). Some sites of this period are as much as 5 ha in area, substantially larger than such roughly contemporaneous sites as Mound C, near Kangavar, and other sites to the east and southeast of Mahidasht (McDonald 1979:567ff.).

Dalma pottery (Godin X) was found on only 13 sites, but their distribution may reflect a change in land use in Mahidasht. Three clusters of sites seem to be fairly uniformly spaced, with individual sites apparently separated from one another by distances of about 4 or 5 km.³² Some of the Dalma sites appear to lie at slightly higher elevations than those of the previous period, and the locations of some sites of this range reflect what may have been an initial occupation of some of the smaller side valleys. In addition, in apparent contrast to both the J ware period in Mahidasht and Godin X in Kangavar, the distribution of some of these Dalma sites is linear, although McDonald (1979:582) describes some of them as being in "areas where only rain fed crops could be grown."

In Mahidasht, Dalma pottery is apparently always found on sites that also have Ubaid pottery, leading Levine (personal communication) to suggest that in this region Dalma may not have been a separate period. Of a total of 116 Ubaid sites, about one-third are located in uplands, and many are not situated on water sources (Levine and McDonald 1977:49). Several of these sites are 5 ha in area, and some may have been larger (Levine and McDonald 1977:50). In comparing the settlement patterns of the J ware and Ubaid periods, Levine and McDonald suggest that at ca. 5000 B.C. a slight drop in temperature coupled with an increase in effective humidity may have permitted some farmers to move away from the immediate environs of streams in areas with poorly drained soils and occupy locations with well-drained soils that were not necessarily near sources of

³¹Hole (n.d.) indicates that 13 Sarab-like sites have been found in the Kermanshah area; Levine and McDonald (1977) report finding 7 in their 1975 survey.

³²The scale of the maps published to date does not permit an accurate computation of distances between sites.

surface (irrigation) water. They suggest that with virtually no change in agricultural practices, expansion into areas with better soils would have resulted in both an increase in cultivated hectareage and an improved productivity of (rain-fed) cereal crops, permitting the support of an increased population, apparently reflected in the doubled number of settlements. In short, they suggest that in Mahidasht, population may have increased without having been preceded by an intensification of productive technology per se.³³

Ubaid period sites in Mahidasht may be roughly contemporary with periods IX–VI in the Kangavar area, although very few Godin VII–VI ceramic types were found in Mahidasht (Levine 1976:160). In Kangavar, 60 sites were occupied during one or more of these periods. In Mahidasht, in a surveyed area approximately twice the size of that explored by Young in 1974, the number of sites in the same time range is about twice that in Kangavar. As has been noted, some Kangavar sites of this period are located above the valley floor, some are on stream banks, and others are aligned linearly but away from streambeds, suggesting the possibility of an increasing reliance on canals leading water off permanent or near-permanent streams like the Khorramrud. Levine and McDonald (1977) do not discuss the development and elaboration of irrigation technology in Mahidasht, and Levine (personal communication) does not think that irrigation here is this early. However, the survey data as published to date suggest that both simple gravity-flow irrigation and a site size hierarchy may have existed at an earlier date in Mahidasht than in Kangavar.

The eastern end of the 1975–1978 Mahidasht survey area is bounded by the Gamas-i Ab, the river which drains the Kangavar valley and also marks the western border of much of the area surveyed by P. E. L. Smith, T. C. Young, and L. D. Levine during 1965. In 1977, following the completion of the Ganj Dareh excavations and of the Hulailan survey (described below), Smith and Mortensen (1980) surveyed near Ganj Dareh, locating (among other sites) three additional aceramic mounds. Within their survey area of approximately 625 km², Ganj Dareh and the three new sites are situated within an area having a radius of about 7 km. Ganj Dareh lies close to a small village set in a constriction within the valley; to its west and south, other modern settlements are arrayed in a roughly linear fashion northwest–southeast down the length of the valley floor, often at fairly regular intervals of 1–2 km. The location of most of these settlements in the valley center rather than at its margins is presumably attributable to their reliance on the waters of the Gamas-i Ab. Harsin, the regional center just southeast of the area for which 1966 census data were tabulated (Table 6.4), is generally viewed as the northern gateway to Luristan province. As in Mahidasht,

³³Their explanation (Levine and McDonald 1977:49) relies heavily on the Zeribar and Gulf data described above. When the Mahidasht materials are published in greater detail, it will be interesting to compare the locations and areas of settlements of various periods; if there was an increase in hectareage cultivated, it might be reflected in changing sizes of Thiessen polygons generated with a formula adjusting for differential site sizes.

survey data from the Ganj Dareh area and parts of Luristan suggest that village settlements antedated those of the Kangavar valley to the northeast.

Over the past 20 years, a number of archaeological surveys have been carried out in Luristan. Work has been done in the Khawa plain, southeast of Ganj Dareh and west of Nehavand (Goff and Pullar 1970), in Borujerd (Young 1966), in Khorramabad (by Young [1966], Hole and Flannery [1968], and J. Berman), and in Hulailan (Mortensen 1975, 1976). Additional work in the areas between Mahidasht and Luristan was carried out by Braidwood's staff in 1960 and 1961, and from Luristan to Khuzistan by Hole and Flannery during 1961 (Hole 1962; n.d.). In their 1961 Luristan survey, Hole and Flannery found very few early village sites in the valleys between Mahidasht and Deh Luran to the south. Tarhan and Rumishgan showed "little trace of permanent occupation," and Kuh-i Dasht has remains of early villages only in "certain localities" (Hole and Flannery 1968:167). These authors suggest that early farmers preferred areas with high water tables, which augmented rain-fed cereal cultivation. Levine and McDonald (1977:49) and Hole (n.d.) also discuss determinants of site distributions.

Hole and Flannery excavated two caves in the Khorramabad area. These sites, Kunji and Ghamari, which contained remains of domesticated goat, have been interpreted as pastoralists' camps and are tentatively dated to the early sixth millennium (Hole and Flannery 1968:166). Based on her later survey in Khorramabad, J. Berman reports (personal communication) that the earliest widespread ceramics in the area are those named after the site Bagh-i No, provisionally dated to the end of the fifth millennium. This site yielded remains of domesticated wheat and barley, lentils, pistachios, caprovids, and cattle (Hole n.d.). A slightly earlier occupation of Luristan may be indicated at Tepe Abdul Hosein, which has an aceramic component overlain by an occupation with ceramics, perhaps related typologically to those of Bagh-i No and Seh Gabi's Mound C, and with pistachio, domesticated barley, and possibly domesticated emmer wheat (Pullar 1979, 1981). Young's report of his 1961 survey also refers to ceramic evidence of what was probably late sixth through fifth millennium occupation (Young 1966; personal communication). Two of his more general conclusions based on that survey are interesting. First, he found a "wide spread of human occupation in this general time range." Second, he detected regional variation in ceramic distributions even within the central western Zagros during that period (1966:234). These observations are supported by other surveys and by a range of excavated materials.³⁴

³⁴Discussing remains of this time range in the Kurdish area to the north of Young's 1961 survey area, Swiny (1975) similarly reports evidence of occupation in the fifth millennium around Miandoab, Saqqez, and Bijar, where he found pottery resembling that excavated at Hajji Firuz and Dalma Tepe in Azerbaijan (Hamlin 1975; Voigt 1976). He notes that farther east, near Takestan and Zenjan, such ceramic types were not found. In her survey of the Malayer plain, Howell (1979) located a number of prehistoric sites with ceramics comparable to those

Evidence of regional variation is also seen in excavated and survey data from Hulailan, a Luristan valley between Mahidasht and Deh Luran. Mortensen's intensive survey produced more evidence of early Holocene occupation than had been found by earlier visitors to the area; much of the ceramic material is distinctive, although some similarities with materials from other parts of the Zagros and adjacent foothills have been noted by Mortensen and a number of other writers. Within a portion of the Hulailan valley measuring roughly 150 km², Mortensen recorded more than 100 sites in an area of approximately 80 km² surveyed during 1973 and 1974. In addition to Tepe Guran, he located a total of five "neolithic" mounds and three caves. These sites are not all fully contemporaneous, and some of the caves may have been used by villagers on a seasonal basis. The Hulailan neolithic sites are all less than 1 ha in area, and the caves are even smaller. The village sites are about 5 km apart (Mortensen 1974:26), a distance exceeding that between any two neighboring settlements either in the succeeding "chalcolithic" period or in the present.

During the chalcolithic period (roughly, the fifth millennium) there was a total of nine settlements in the northwestern corner of Hulailan, some marking the first occupation east of the Jazman Rud; the average distance between them was about 2.5 km (Mortensen 1974:46). Mortensen comments that the distribution of settlements throughout the plain was more "even" than it had been previously, when settlements were all situated on perennial rivers or near springs, and he suggests that the altered site distribution reflects the introduction of canal irrigation onto the plain (1974:31).³⁵ Although most sites dating to this period are still less than 1 ha, some are between 1 and 2 ha in extent. Mortensen's maps suggest that the concentration of these sites in an area of about 20 km², on the best agricultural land in the valley, would have given each of them approximately 200 ha of sustaining area if they were all occupied simultaneously. If average settlement size had been about 1 ha, population estimators of 100 and 200 persons per hectare of settlement area might imply sustaining areas of 1–2 ha per capita.

In Hulailan, the number and size of sites diminished during the fourth millennium (in the period roughly contemporary with Godin X–VI/V). Citing the Zeribar core, Mortensen (1974:32) posits a population decline related to increasing problems with cultivation resulting from the interaction between a slight drop

of the Godin–Seh Gabi sequence. In Malayer, there may have been a bimodal site size hierarchy in Godin VI times (Howell, personal communication). These later occupations were preceded by several sites with pottery like Sarab and "Shahnabad" (Seh Gabi Mound C), so that it would appear that the area southeast of Aliabad was also occupied during the fifth millennium. That the eastern slopes of the Zagros and the western portion of the Iranian plateau were also settled in this time range has been demonstrated by excavations at such sites as Zaqeh (near Qazvin) and Sialk (near Kashan), whose ceramics are in many respects typologically distinct from those of the central Zagros.

³⁵During the fifth millennium there appear to have been no temporary hunting stations in the hills flanking the valley floor, and the quantity of flint implements, less than previously, suggests to Mortensen (1976:46) that hunting was of diminished importance and that the hills bordering Hulailan were not used as pastures.

in temperature and increasing salinization resulting from irrigation. He also suggests that subsequent (late Uruk) use of caves may reflect seasonal occupation of the Hulailan plain by pastoralists, and argues for the relevance of models for the evolution of this specialized subsistence adaptation (Adams 1974; Lees and Bates 1974) that relate it to both the development of complex political institutions and increasingly intensive agricultural practices.

Today, in addition to pastoralists, Hulailan supports about 30 villages on approximately 13,000 ha of good arable land (Meldgaard *et al.* 1964:104; Mortensen 1975:34); 10 of them, within the borders of Mortensen's surveys, are incorporated in Table 6.4. With the exception of a cluster of three early chalcolithic sites in the center of the plain, the pattern of neolithic and chalcolithic settlement does not seem to differ substantially from that of villages in the northwest corner of Hulailan today. Most settlements in this area are situated either at the intersection of foothills and lower-lying agricultural land, or immediately adjacent to the Jazman Rud and its tributaries draining the hills to the north and west. As seems to be the case throughout the Zagros, several of the early sites in this area are in the immediate vicinity of modern villages.

ARCHAEOLOGICAL "SUSTAINING AREAS"

Archaeological surface surveys reflect variations and changes in settlement pattern; such patterning is related in part to resource utilization. Changes in land use are in turn related in complex ways to demographic transformations and to changes in political and economic relationships among settlements articulated on a regional scale. Some alterations in land use strategies no doubt reflect changes in perceptions of needs for "surplus" and redefinitions of "labor" (Bayliss-Smith 1978). It might be argued that archaeologists lacking documentary and/or archaeological data on technology and technological change and without operational measures of surplus may be unable to monitor diachronic (or synchronic, interregional) variability in productivity. Nonetheless, many archaeologists seem to consider the effort worthwhile.

For example, using locational data and site sizes, and assumptions about worker capability (derived from ethnographic data), Johnson (n.d.) has questioned the extent to which growth in administrative centers during the Uruk period in Khuzistan might have necessitated an increased reliance on surplus produced by surrounding villages. In an earlier study (1973:94ff.), he used site areas and estimated sustaining areas (based on mean distances between sites) to argue that data on productivity in contemporary southwestern Iran compare favorably with estimates for late fourth millennium hectareage needs. Thus, one approach to prehistoric sustaining areas uses site areas, population estimates, and estimates of labor inputs; another, also utilizing ethnographic data from the same

area, would focus instead on productivity and per capita consumption patterns. In outlining some of Young's Kangavar survey data, I suggested that diachronic variations in one area may be tentatively evaluated by establishing the number and sizes of contemporaneous prehistoric sites, using density estimators to suggest a range of prehistoric populations at each of those sites, and multiplying such figures by the amount of sustaining area assumed to be required by those populations. The rough figures generated by this procedure (Table 6.3) suggest that the Kangavar area population in the fifth and fourth millennia had not reached the level of "carrying capacity" implied by modern census figures.

In the portion of Young's 1974 survey that overlaps with the area shown in Figure 5.1, there is a total surface area of some 38,820 ha. According to the gazetteer based on the 1966 census, only about 15,000 ha are actually utilized (in crop production) by the 41 settlements in this area today. At least some of this hectareage probably supports the nearby center of Kangavar. With a combined population of 24,500, these 42 modern settlements might thus be supported by an average of .6 ha per capita. Although the contemporary pattern of settlement differs somewhat from that of the early village occupations in the area (characterized as it is by more settlements, some at higher elevations, and spread in greater numbers along the tributaries of the Khorramrud), the mean distance between modern villages (approximately 2 km) is comparable to that of Godin VI times. If one assumed sustaining areas to surround modern villages in a roughly circular pattern, a line drawn midway between two neighboring villages in this region would place a "boundary" between their lands at approximately 1 km from each village. This figure has appeared in some of the literature on site catchment analysis, having been described in a study by Chisholm (1962) as a limit beyond which farmers in many parts of the world rarely need to travel to reach their fields. In the Kangavar survey area, a sustaining area reconstructed on the basis of a 1 km radius would give each of the 41 modern villages something on the order of 314 ha, not much above the 301 ha owned by Aliabadis, and comparable to the raw hectareage figures tabulated in the gazetteer (which indicate a mean village holding of 393 ha, and a median holding of 247). During Godin VI, apparently the last prehistoric period in the area (Weiss and Young 1975), comparable catchment radii and areas may have existed, with areas lying beyond them being little used for cultivation, and perhaps devoted to pasture.

In Mahidasht, not far west of Kangavar, the broad pattern of settlement has reportedly remained fairly constant over the past six millennia (Levine 1974:490), although a comparison of Levine's published archaeological distribution maps with data in the 1966 census and gazetteer suggests that, as in Kangavar, a larger percentage of modern villages is located above the 1524 m contour. It appears that there are more settlements southeast of Kermanshah (along the Qara Su) than there were during the fifth and early fourth millennia, and the survey area today supports more than twice the number of settlements (with a

total population of almost 45,000) than can be reconstructed for the Ubaid period.

There seem to be some interesting differences between contemporary settlement patterns in Kangavar and Mahidasht.³⁶ Mahidasht appears to have more small villages and fewer settlement size (population) classes than the Kangavar area, and overall regional density may be somewhat lower (see Table 6.4). Gazetteer data suggest that, in comparison with Mahidasht, the Kangavar area today has a more complex site size hierarchy and perhaps supports comparatively larger nonurban sedentary populations. Such variations might be due not only to differences in the sizes of the two survey areas (i.e., to sample scale alone), but also to variation in contemporary land use practices and, perhaps, differences in the functions of their respective centers within both regional and national frameworks. That contrasts between the two regions may extend back to the prehistoric period is suggested by the somewhat earlier occurrence of larger (5 ha) sites in Mahidasht, where canal irrigation may also have been practiced slightly earlier than it was in Kangavar. That Mahidasht apparently saw sedentary settlement prior to the development of village life in Kangavar might be an artifact of differences in survey size (Mahidasht being substantially larger than Kangavar), but it might also be related to the slightly lower elevations of its valley floors, and perhaps slightly moister, more wooded, and generally somewhat more congenial environment in the late sixth and early fifth millennia.

Prehistoric sustaining areas can be reconstructed by using sustaining area radii, like those referred to above, and Thiessen polygons, which are a means of estimating areas servicing centers (Haggett 1965; Hodder and Orton 1976). In constructing Thiessen polygons, one maps the totality of presumably contemporaneous settlements within a study area, and delineates boundaries between them by dividing the distance between each pair of neighboring settlements such that each site is surrounded by an irregularly shaped perimeter enclosing an area assumed to be the site's sustaining area. Whereas the radii of catchment area

³⁶In Mahidasht, of 265 villages in Levine's 1975 survey area, the vast majority ($N = 258$) have populations below 500; of these, a large proportion ($N = 84$, or nearly one-third) have populations below 100. In Kangavar, only 5 of 89 villages (approximately 5%) have populations below 100. A larger proportion of Kangavar's villages have populations between 501 and 1000 ($N = 12$, or 13%), compared with only 7 villages of this size class in the Mahidasht survey area (about 2% of the area's villages). In Mahidasht, this is the largest size class below that of Kermanshah itself, and these larger villages are clustered in the immediate vicinity of Kermanshah city. (In the area surrounding Hamadan, not considered here in any detail, there are also several very large villages and small towns, including Lalajin, Kabudrahang, and Meryanaj.) In contrast with Kermanshah, the largest (population) size class below that of Kangavar itself is in the range 1501–2000, and these villages, like those with populations of 1001–1500, are at considerable distances from that center and from one another. Mean (168) and median (138) village sizes in Mahidasht are substantially lower than they are in Kangavar (see Tables 5.1 and 5.2) and rural population densities for the Mahidasht survey area are lower than those in the Kangavar survey area. I noted in Chapter 5 that an increase in sample area can increase the range of variability observed (e.g., in village population size), and that might account for some of these differences between Kangavar and Mahidasht. Given the reasonable size of the Kangavar area sample, however, that seems an unlikely explanation for the particular kinds of variations which seem to exist.

reconstructions would generate a series of circles around sites, leaving “empty” spaces between such circles, Thiessen polygons fill in all the spaces between sites. However, the technique assumes that a settlement dominates all of the area lying geometrically nearest it (Haggett 1965:208f., 247f.); ethnographic observations are instructive in suggesting that this may not always be a correct assumption (for example, although the 32 *juft* listed in the census would be part of a polygon surrounding Aliabad, it would not necessarily include all of the additional 11 *juft* owned by its inhabitants). Further, since each settlement is treated as a point rather than as an area, Thiessen polygons do not allow for the possibility that different-sized populations in sites of differing size might affect variations in polygons’ scales; a gravity model has been used to develop a formula to overcome this limitation (Hodder and Orton 1976:188).

Thiessen polygons for the Aliabad area were generated by using modern gazetteer data on sustaining area. There are discrepancies between the gazetteer’s listings of sustaining area and sizes of the Thiessen polygons drawn for the region shown in Figure 5.1; specifically, hectareage per village recorded in the gazetteer is consistently smaller than it is when generated by Thiessen polygons (even when they are adjusted for variations in sites’ populations). Despite the gazetteer’s deficiencies, and the many analytic and interpretive problems which they raise, there is no evidence of patterning in the discrepancies that emerge in this exercise (such as might result from census workers’ systematic omission of pasture lands or failure to account for an alternate-year fallow system). Not surprisingly, therefore, this experiment seems to support a point made both implicitly and explicitly in the foregoing discussion: not all of the available land surface is actually utilized by villagers. In the Aliabad area today, it appears that almost 60% of the countryside is not included in villages’ sustaining areas.³⁷

Another experiment with Thiessen polygons and contemporary Southwest Asian settlements suggests some of the ways in which this technique can point the archaeologist in new directions.³⁸ Wagstaff’s nearest-neighbor analysis of

³⁷Although for reasons described above some of the gazetteer figures are somewhat too low, the sum recorded hectareage for 80 of the 96 villages shown in Figure 5.1 is 38,108 ha (see Chapter 5, note 18). Given a total area of 104,000 ha (in Figure 5.1), something on the order of 60% of the land surface is not recorded as part of the villages’ holdings (a somewhat less reliable total of 40,236 ha for the 96 villages also leads to this conclusion). If we assume that the towns in the area (Kangavar and Asadabad) have additional hectareage (over and above that constituting the towns proper), the figure of 60% would be reduced. The gazetteer figures might be too low because they do not include hectareage attached to villages other than those censused (as is the case in Aliabad). The possibility exists that in instances where data on village holdings were provided by village elders, confusion arose and data were given in *juft* rather than hectares (see p. 65). Finally, given the elevation and topography (and hydrology) of the region, one would expect large tracts to be uncultivated, since numerous areas are higher than the normal altitudinal range of the major cereal crops, erosion is rampant, and villagers allocate some upland areas to pasture rather than farming; on theoretical grounds alone, one would not expect all of the available terrain to be cultivated.

³⁸The work of Braidwood and Reed (1957) on northeastern Iraq discussed in Chapter 5 involves the same underlying assumptions as are used in constructing Thiessen polygons, since they treat settlements as points and break up the region on the basis of distances between “randomly” selected pairs of nearest neighbors. In this way, Braidwood and Reed arrive at their (rather generous) figures for sustaining area, discussed above.

modern settlements in the Asvan area (Turkey) shows that they are arrayed in a regular rather than a random or clustered distribution ($R = 1.8$). This suggests to Wagstaff (1973:213) that settlement locations might have had a "reciprocating effect upon each other, and that the present pattern developed over a period of time, not more or less simultaneously." Thiessen polygons constructed for this area show that the spatial regularity implied by the nearest-neighbor value is not due to an equal division of the total area among settlements. Rather, these abstractly constructed territories vary in size and shape, as well as in the kinds of terrain that they encompass. Detailed analysis of land use in one of the villages (Asvan) indicates that there is even greater variation within its resource area than is suggested by the diversity in the Thiessen polygons. On the basis of the kinds of territory that Asvan actually controls (in contrast to those enclosed within its theoretically derived polygon), Wagstaff has tentatively concluded that it may be the oldest settlement among those included in his analysis (having "forced" later settlements to adjust their territories accordingly) and, further, that Asvan's territory may have initially been delineated so as to ensure maximum ecological diversity and hence greatest possible economic security to its inhabitants.

Both the Aliabad and Asvan exercises with Thiessen polygons suggest that by specifying the absolute upper limits of land available for points (settlements) within a bounded region, the technique may be a useful means of comparing synchronic and diachronic data, both within and among regions, since it yields quantifiable statements about sets of contemporaneous sites. The value of Thiessen polygons would thus seem to lie precisely in their facilitating comparisons, rather than in their ability to generate magic numbers about individual settlements' sustaining areas.

Thiessen polygons provide one method of analyzing data for a number of contemporaneous sites, by allocating portions of a given area to a given group of sites; it is a regionally oriented technique. In contrast, site catchment analysis is oriented to the individual site, and therefore potentially ignores interactions among neighboring sites as well as the possibility that several sites might have been used (perhaps seasonally or sequentially) by a single group of people. Site catchment analysis has been defined as a "study of the relationships between technology and those natural resources lying within economic range of individual sites" (Vita-Finzi and Higgs 1970:5). Using ethnographic and historic data, and relying heavily on Chisholm (1962), Vita-Finzi and Higgs (1970) analyze prehistoric sites in terms of 1-, 5-, and 10-km radii drawn around them. The limitations of the approach have been discussed by Brumfiel (1976), Flannery (1976a), and others. Flannery (1976b:116) points out that archaeological catchment areas are best defined in conjunction with excavated data, which provide information on the exploitation of plants and animals by sites' inhabitants, and thereby permit a more realistic reconstruction or retrodiction of a site's

sustaining area than might be made simply by measuring differentially productive areas within arbitrarily defined circles.

Some site catchment analyses have an impressionistic and qualitative tone (since it is difficult to classify land, whose productivity, value, and ease of exploitation vary with climate, technology, size of labor force, and a number of other factors). Nonetheless, the approach has some interesting features. For example, there do seem to be limits beyond which modern farmers are reluctant to walk to reach fields producing their chief staple crops (Chisholm 1962). Most of Aliabad's fields are within 1 km of farmers' homes; the farthest field (within Aliabad's 32 *juft*) is at a distance of 2.2 km. The terrain is essentially flat, but it is crisscrossed by a number of irrigation canals, which slow transit time somewhat when they flood adjoining roads and tracks. If a farmer has an ox or donkey, his travel time may be even longer (Watson 1979:74). If one assumed a sustaining area surrounding the village, and an average distance of 1.5 km from village to field, one would predict a core catchment area of 7.1 km², or 707 ha. If instead Chisholm's and Vita-Finzi's figure of an average of 1 km were used as the radius separating Aliabad from its farthest fields, the estimated catchment area would be 314 ha, which is close to the figure for the village's 43 *juft*. The lack of detailed ethnographic data on the differential location and size of fields precludes an extended consideration of this question. However, it is noteworthy that many Aliabadis describe their fields as being within a few minutes' walk from home and that, given the dispersal of individuals' fields in the village's total sustaining area, it is sometimes necessary to walk to different fields, in different directions, in a single day. To have several simultaneously cultivated fields at greater distances than 1 km would make it difficult if not impossible for a single man to travel to and work such dispersed fields. The Aliabad data and survey data for the late prehistoric period would seem to support the general notion that agricultural villages have catchment areas, although they may differ in content and scale from those that might be reconstructed by Vita-Finzi, Higgs, Jarman, and others. They also suggest that ethnographic data on consumption and productivity may be useful in developing estimates of prehistoric population sizes and in reconstructing at least some features of prehistoric sustaining areas.

SUBSISTENCE, SETTLEMENT PATTERN, AND EARLY VILLAGES: OVERVIEW

Data reviewed thus far suggest that by 5000 B.C. central western Iran was occupied by people relying at least in part on the key plant and animal species exploited to the present day. Excavations at such sites as Sarab, Seh Gabi, Kunji, Guran, Tepe Tula'i, and Ali Kosh indicate that settlements in western Iran were located at a range of elevations and in a variety of habitats. Some of them were

almost certainly occupied year-round by agriculturalists; others, like Kunji and Tula'i (Hole 1979), may represent herders' seasonal camps. The early post-Pleistocene period in this area is poorly understood partly because many small, shallow sites have been buried beneath a meter or more of recent sediments. However, in combination, excavated data from individual sites, regional settlement pattern data from surveys, and a variety of palynological and sedimentological data indicate that by the mid-fourth millennium, at the latest, some important features of environment and land use were comparable to those of the present.

Some features of settlement pattern, internal organization of settlements, and subsistence economy may have assumed a "modern" appearance even earlier. For example, by ca. 5000 B.C. dry-farming of wheat and barley and herding of sheep and goats appear to have been well established. In central western Iran and adjacent areas, bins, ovens, sickles, grinding stones, and spindle whorls suggest that the products of plants and animals were processed in a manner similar to that of the present. At a somewhat later date, domesticated cattle and pigs were added to the livestock inventory, and artifactual and locational evidence suggest that simple canal irrigation was added to the technological repertoire. Botanical remains (such as linseed, and perhaps six-row barley), excavated canals (e.g., at Chogha Mami; Oates and Oates 1976b), and linear site distributions (Oates 1972) indicate that gravity-flow irrigation had been introduced at lower elevations by about 5000 B.C. Settlement-pattern data from Kangavar, Mahidasht, and Hulailan suggest the use of canals in the central Zagros by ca. 3000 B.C., and perhaps as early as 4000 B.C. In addition, although the earliest pictorial and epigraphic evidence for the use of plows derives from the neighboring Mesopotamian lowlands and dates to the mid-fourth millennium (Oates and Oates 1976a:119), it is possible that cattle were used for traction and that perishable wooden plows were used at a somewhat earlier date in highland as well as lowland areas. At Seh Gabi and Godin Tepe such an inference is suggested by the apparent absence in any significant numbers of stone artifacts interpretable as hoes; in Khuzistan, there are hoes at Qabr Sheykheyn, dating to ca. 4200 B.C. (H. Weiss, personal communication), but plow marks excavated near another Khuzistan site of the Susa A period suggest the use of plows by the end of the fifth or beginning of the fourth millennium.

Mounds are the most abundant and archaeologically obvious evidence of settlement from this early time range, and excavations have revealed that they are usually the remains of small villages of multiroom rectilinear houses built of packed mud and sun-dried mud bricks. Many of these prehistoric villages were less than 1 ha in extent, and they were generally separated from one another by distances of only a few kilometers. By the end of the fifth millennium, and probably a good deal earlier, the architecture of Zagros villages had assumed a number of modern features. This is seen in building materials, construction

techniques, room dimensions, wall thicknesses, and formal attributes of such internal features as hearths, ovens, and bins, as well as the presence of courtyards and two-story structures at some sites.

The excavation of more sites antedating 4000 B.C. will permit a more comprehensive documentation of early villages' internal organization, and facilitate the evaluation of variations among contemporaneous settlements. Future work should also illuminate evolutionary trends in architecture and the changes in socioeconomic organization that they reflect (Flannery 1972; Redman 1978). At present, the number of prehistoric sites in the central Iranian Zagros at which one or more complete houses have been both cleared and published is very small. More extensive excavations elsewhere in Southwest Asia reveal multiroomed rectilinear houses, some featuring internal courtyards, dating to 5000 B.C. and earlier (e.g., Jarmo, Hacilar, Hajji Firuz, Hassuna, Tell es-Sawwan, and Tall-i Bakun). The two-story structures of Ganj Dareh and Seh Gabi have parallels elsewhere in the Middle East (for example, at Hacilar, and perhaps also at Beidha and Cayonu).

Functional differentiation within houses in the early villages of central western Iran is suggested by the probable existence of stables or pens (e.g., Seh Gabi), storerooms (e.g., Ganj Dareh), kitchens (Seh Gabi, Guran), and courtyards (Seh Gabi, Guran). The impression conveyed by preliminary reports of excavations at early village sites in this area is that when two or more houses have been excavated, they vary in size and number of rooms, and in overall house size. At the same time, the evidence suggests that most early structures were probably residential and that similar activities were carried out in many of them.³⁹ Elsewhere in Greater Mesopotamia, large structures excavated at such lowland sites as Tell es-Sawwan (ca. 5000 B.C.) have been interpreted as possibly religious in nature (Mortensen 1970:133; Oates 1972:306), but similarly "monumental" buildings are not reported for such an early date in the Zagros proper.

In sum, comparisons of rooms within one structure, of various structures at one site, and of structures at different sites indicate that by about 5000 B.C. architectural diversity was the rule rather than the exception in several parts of Southwest Asia (see Watson 1978). There is no reason to assume that this was not also the case in central western Iran, which surveys show was settled from Mahidasht to Malayer and beyond. Evidence for regional variation in ceramics, architecture, and settlement organization by the fifth millennium suggests that there may be little empirical support for the notion that early Middle Eastern communities were "pristine," undifferentiated, and egalitarian, with any one excavated house typifying those remaining buried and untouched. Expanded samples are badly needed to flesh out the skeletal picture sketched here and to

³⁹A room at Ganj Dareh interpreted as having a "ritualistic function" (Redman 1978:169) contained a plastered niche with two skulls of wild sheep; the scale of the structure itself, however, was not particularly "monumental."

provide detailed documentation for the nature of the variability implied by even the limited data available. Such variations as those noted here cannot have been completely unrelated to the more obvious diversity of the succeeding two millennia.

In addition to architecture, functional or occupational differentiation or evidence of ranking might be seen in mortuary remains, but in the central Zagros these are fairly scanty. The relative paucity of adult burials in settlements of the sixth, fifth, and fourth millennia suggests that some villages may have had spatially discrete mortuary areas. Given sample sizes and trench locations, the hypothesis that cemeteries existed in this time range can neither be confirmed nor refuted, but evidence from those few early sites with more than just a few (intramural) burials (e.g., Catal Huyuk, Ganj Dareh, Tell es-Sawwan) suggests both that mortuary treatment was variable at any given site and that village cemeteries may postdate the sixth millennium.

Villages in the central Iranian Zagros became increasingly numerous and increasingly large in the fifth and fourth millennia. Survey data indicate that by the fourth millennium many settlements in the Kangavar area were comparable in size with modern villages near Aliabad, and the same was true even earlier in Mahidasht. Larger sites of slightly later date, such as Godin in the late fourth and early third millennia, appear to have been areally in a class with the larger villages in this region today. While most settlements in these areas approximately 5500 years ago were 1 ha or less, some were in the range of 1–2 ha, and a few were as large as 5 ha.

Many of these sites were occupied over long periods, and their later components sometimes obscure the extent and nature of earlier occupations. Despite difficulties inherent in reconstructing prehistoric settlement patterns, survey data from central western Iran strongly suggest that by ca. 3500 B.C. site size hierarchies had developed. Such variability among contemporaneous sites suggests that it is inappropriate to assume that any single site typifies them all, and that archaeologists should evaluate material from individual sites with a view to their wider regional context. Variability in site area appears to be related in part to differences in sites' functions and the sizes of their populations, and these as well as sites' locations must relate to interactions between inhabitants of different sites. To monitor prehistoric settlements' variability and relationships effectively, it would be desirable to obtain and compare samples from various sites. Some of the differences between smaller and larger (modern) settlements were discussed in Chapter 5, and it was suggested that although it may be difficult to differentiate among archaeological sites of varying functional size, it might be possible to distinguish small centers from large villages (for example) through a combination of survey and excavation techniques.

Even within a single site it may be difficult to establish the extent and content of variability. For example, there are indications in the literature describing

Middle Eastern cities that some city centers are more densely settled than other urban areas, and that there may be associations between differential density and variations in inhabitants' economic rank. It was suggested that archaeologists wishing to monitor such variation within large centers might consider sampling techniques incorporating transects extending from site centers to peripheries. Some ethnographic data also indicate that cities have large open areas. In the old section of Delhi, for example, between 30 and 40% of the city's gross area is nonarchitectural space; Fonseca reports that about 25% of Delhi's area comprises houses' courtyards, and 10–12% its streets (1969:111). Alten (1959:8) notes that almost 19% of Sanandaj consists of cemetery, in this part of the world nonarchitectural almost by definition, and an additional 2% is vacant land. He also notes that, as in many Iranian villages, each Sanandaj house has its own courtyard. Alten did not, apparently, measure streets and alleys in this Iranian town, but he notes that in American cities such areas comprise 15–20% of total urban space (1959:10). David's discussion (1975) of houses in old Aleppo and in Tunis suggests that large proportions of those urban centers are also unroofed; excavations show that a similar pattern obtained in the sixteenth-century Moroccan site at Qsar es-Seghir (Redman and Anzalone 1980). Like cities, villages also have many unroofed and unbuilt areas. This ethnographic observation has implications for archaeological excavation strategies, which provide the raw materials for identification and interpretation of variability in activity areas and residential structures, and the host of socioeconomic factors to which these may be related.

ROOFED AND UNROOFED SPACE AND ARCHAEOLOGICAL SAMPLING

Excavations at many ancient sites have revealed areas which appear to have been unroofed. Approximately 40% of Aliabad, a village of about 3 ha, is nonarchitectural. Because I assume that the village's cemetery and threshing floor would probably be archaeologically invisible (in surface reconnaissance), they are not included in areal calculations summarized here. The dotted line in Figure 6.1 delineates the area that will probably assume the form of a mound of decayed mud structures after the settlement is abandoned. Approximately 1.7 ha (60%) of this area are covered with structures (shown as shaded blocks); the remaining 1.3 ha comprise open spaces (alleys, dung-processing areas, and village commons). Of the 60% of Aliabad's area that is architectural, a substantial portion (8184 m², or 47%) is unroofed (consisting of courtyards, pens, and unroofed storage areas). Not all of the remaining 53% of the village's architectural area (classified as "roofed" here and in Chapter 4) has substantial roofing. For example, some places (particularly courtyard entrances, latrines, outdoor ovens, and some animal pens) are covered with only a flimsy roof of thatchlike

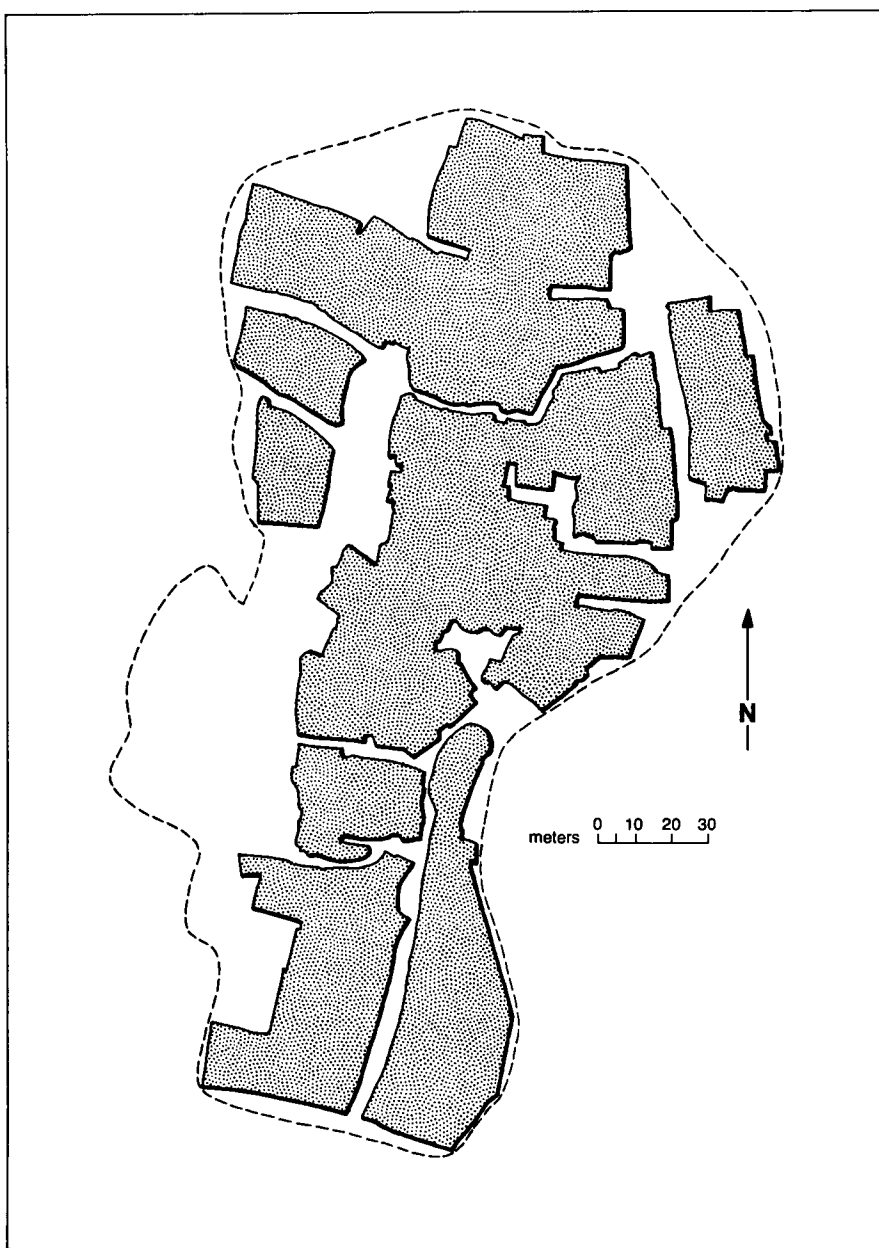


Figure 6.1. Aliabad as an archaeological site (house blocks are shaded, predicted mound edge is a dashed line). See Figure 2.1.

brush. In combination, completely unroofed architectural areas and open areas such as alleys and commons total 1.97 ha, comprising 66% of Aliabad's 3 ha. Thus only one-third of the village's total area is actually covered with some sort of roofing material.

That the proportion of unroofed area in village compounds varies is evident from a casual inspection of Figure 2.1 and the house plans in Chapter 4. A small corpus of comparative data from other Southwest Asian villages (Table 5.3) suggests that the pattern may be widespread. For instance, a sample of six Iranian and Turkish villages (in addition to those listed in Table 6.5) suggests that nonarchitectural space can range from 30 to 55% of total village area (Kramer [n.d.]c). With the addition of unroofed courtyards, the proportion increases.

The material in Table 6.5 requires some clarification. All of the figures shown here represent my conservative estimate of the area that will eventually be covered by the melted-down remains of clustered mud structures. Hasanabad has been described as somewhat larger than is indicated here (Watson 1978, 1979), but I would expect that when transformed into an archaeological site, it will not be substantially larger than 1.4 ha. Of this area, some 9300 m² is taken up with architecture. As in Aliabad, roughly two-thirds of the settlement is covered with structures, and the remainder is open. Hasanabad has 41 residential buildings (including an old fort, which now serves a residential function). Eleven of these structures, including the fort, were measured in order to determine what percentage was unroofed courtyard. One of the 11 houses does not have a courtyard; in the remaining 10 compounds, the courtyard comprises from 40 to 70% of overall area (on average, unroofed courtyards take up 55.5% of compounds' areas). The fort, Hasanabad's largest structure (measuring approximately 1064 m²), has a courtyard taking up about 52% of its total area, which is in the range of other houses in Hasanabad and of some houses in Aliabad.⁴⁰

Alisar is a Turkish village mapped by von der Osten during the course of University of Chicago excavations at Alisar Huyuk. Morrison (1939) describes it as measuring some 5 ha (or 13.6 ha if the cemetery and threshing floor are included). As in the case of Hasanabad, a narrowly defined perimeter line superimposed on the published plan produces a somewhat reduced village area (4.3 ha). Of this area, housing takes up approximately 1.8 ha, and additional dispersed structures (such as storerooms and a spring house, laundry, and mill) comprise an additional 2255 m² of architectural area. Thus, of Alisar's 4.3 ha, a total of 1.99 (46%) is covered with architecture; the remaining 54% is a higher value for nonarchitectural area than those obtaining in Hasanabad and Aliabad. Detailed metric data are available for only one of Alisar's 58 houses.⁴¹ This

⁴⁰I am very grateful to Patty Jo Watson who, with characteristic generosity, provided me with much Hasanabad data during the years preceding the publication of her definitive monograph (Watson 1979), and who has discussed with me some of the differences and similarities between Hasanabad and Aliabad.

⁴¹In the village map (Morrison 1939:Figure 45) it is not always clear what portion of a given house is roofed and

TABLE 6.5
Roofed and Unroofed Areas in Four Contemporary Villages^a

Settlement	Area (ha)	Entire settlement		Individual houses		References
		Architectural (%)	Open (%)	Unroofed (%)	Range in area (m ²)	
Aliabad	3.0	60	40	47	42–1358 (N = 67)	Figure 2.1
Hasanabad	1.4	68	32	56	120–445 (N = 10)	Watson 1979
Alisar	4.3	46	54	22 (N = 1)	37–321 (N = 7)	Morrison 1939
Asvan (west)	5.6	44	56	58	113–928 (N = 6)	Hall <i>et al.</i> 1973

^a Measurements were made with a planimeter; settlement areas were defined by drawing perimeter lines just beyond villages' outermost structures.

house (Morrison's House E, which is one of the largest in the village and belongs to one of Alisar's wealthiest individuals) has an area of 1119 m²; the courtyard takes up 200 m² (18%), but the attached guest house has its own courtyard, perhaps an additional 50 m², so that the total unroofed space within this compound is about 22% of its total area. Because of its unusual size, this house is shown (as N = 1) in only one column of Table 6.5; the range of areas for seven houses does not include House E. Compared with Aliabad and Hasanabad, Alisar's House E has, proportionally, a small unroofed area (one-fifth), but it is still substantial when considered from the perspective of archaeological sampling strategies and standard trench sizes.

Courtyards and other unroofed areas also comprise a large proportion of the area of Asvan, a village in south-central Turkey now covered by the waters of a dam on the Euphrates. As part of the Asvan Huyuk excavation project, David French and his colleagues carried out "salvage" ethnographic research in the nearby village. The published maps represent architecture standing in 1971, but demographic data and some other information are based on the Turkish government census of 1938; possible discrepancies incorporated in computations based on the Asvan publication were noted in the discussion of Table 5.3. The published map suggests that the total village area is 12.6 ha, but structures are somewhat more sparsely distributed in the eastern portion of the settlement. Because of difficulties inherent in "reading" this section of the published plan,

what unroofed, although in several cases the general size of a compound can be fairly readily determined. Because of the agglutinating character of compounds, which are not always individually labeled, measures of such areas were not attempted for this analysis. The house marked E in Morrison's village map is shown in a detailed map (his Figure 52), and appears to be one of the largest houses in the village. Morrison's Table 7 indicates that House E belongs to one of the village's wealthiest individuals, but because it is not clear which individuals listed in that table reside in which houses shown in Figure 45, associations between economic rank and domicile size in Alisar cannot be examined here.

only a sample (the western half of the village, measuring some 5.6 ha) was examined in detail. Some 2.4 ha (44%) of this area are covered with architecture; the remaining 56% is nonarchitectural. The published sample of seven detailed house plans (selected by the project architect to illustrate different types of layout) includes one without a courtyard; in the remaining houses, courtyard areas comprise a mean of 58% of total compound area (in one of them, the courtyard takes up 84% of the compound). Given the overall settlement plan it would appear that the total proportion of nonarchitectural area within Asvan is probably even higher than the nonarchitectural figure of 56% cited above. Confirmation of this impression would require further detailed measurement, but the data at hand support the additional observation that architectural (and demographic?) "crowding" varies even within this fairly small community.

Because of the scarcity of detailed plans of small-scale settlements, comparable figures are not readily computed for most of the other villages included in Table 5.3, but the pattern suggested by Table 6.5 seems to exist elsewhere in Southwest Asia (Kramer [n.d.]). Photographs and sketch plans of a variety of small settlements, including Tell Toqaan (Syria), Sakaltutan (Turkey), Raddadeh, and villages in Khuzistan's Dez pilot area, suggest that even those villages that would be described as nucleated include substantial areas that are nonarchitectural. Additional data and analysis will permit fuller documentation of the size and function of open areas in such settlements, but a few detailed house plans suggest that they may be comparable to those shown in Table 6.5. At Raddadeh (Khuzistan), for example, a house measuring 329 m² has an unroofed courtyard that comprises 56% of its area (Rouholamini 1973).

Similar patterns appear to exist in rural settlements in other subtropical and tropical regions, to judge from plans and descriptions published by Denyer (1978), Guidoni (1978), Oliver (1969, 1971), Prussin (1969), Schwerdtfeger (1971, 1972), and others. Use of courtyards, roofs, and village commons for a range of domestic activities is widespread throughout the world's warmer regions, from the American Southwest to East Asia. The high proportion of open areas within settlements may thus be the norm rather than the exception in many parts of the world today and in the past, and they may also constitute a large proportion of the area exposed in an archaeological excavation. The foregoing indicates that such open or nonarchitectural spaces are often the loci of important social and economic activities, but the data that they yield to archaeologists' samples may not be as abundant or varied as those associated with structures (Kramer 1981).

Using the perimeter shown in Figure 6.1, grids constituting simple random samples, stratified random samples, and systematic samples of 1, 5, and 10% of the 3 ha area were superimposed on the village map (Figure 2.1, this volume; see Mueller [1975], Ragir [1967], and Redman [1974] for discussions of sampling techniques). The results of this experiment suggest that the amount of unroofed

area may sometimes be slightly underrepresented (being between 50 and 60% in the 5% samples drawn), but for the most part representative proportions of architectural and open areas were obtained regardless of sample size or sampling strategy employed. However, even with the relatively large (hypothetical) excavation units (10×10 m) used, any of these sampling procedures minimizes the likelihood of opening up two or more contiguous excavation units. This exercise suggests that at a small-scale site in which many clustered houses are interspersed with several large as well as smaller open areas, an excavator might obtain some sense of the distribution of structures and open spaces within the overall site area by using any of these approaches and sample fractions. It should also be possible to make preliminary assessments of the range of variability in room types, features, artifacts, and burials within the settlement. Data from "open" areas in the site would illuminate a range of activities which take place outside of houses and could provide information on food consumption and garbage disposal which might not be obtained within architectural areas.

On the other hand, the archaeologist seeking detailed information on houses' spatial relationships (Wilcox 1975), internal organization, and metric attributes would not be greatly enlightened by any of the sampling procedures used in the experiment just outlined. The smallest house in Aliabad is 42 m² in area; if a standard 5×5 m trench were used in a program of systematic or random sampling, it might not be possible to clear in its entirety even this small building. This subject is discussed at greater length elsewhere (Kramer [n.d.]c), but a few additional comments are in order. Although there are some notable exceptions (e.g., Catal Huyuk, Hacilar, Bouqras, Umm Dabaghiyah, Yarim Tepe, Tepe Gawra, Tell es-Sawwan, Godin Tepe, Nuzi, Ur), entire blocks of prehistoric residential buildings have only rarely been exposed, and some of those that have were cleared rapidly and at the expense of nonarchitectural data that might have illuminated a range of activities.

Excavating only one or two structures in a site can reinforce the tendency to view any village house as "typical." It was argued above that because essentially identical activities are carried out in all of Aliabad's 67 houses, formal differences among them cannot be attributed solely to variations in activities. In Aliabad, metric values for particular room types are not very variable, but total metric size of compounds is (ranging from 42 to 1358 m², with an average of almost 200 m). Although the mean is 5, the number of rooms per compound ranges from 2 to 12. Many commonly used sampling procedures might fail to reveal the extent of such variations among compounds; clearance of only a single house would mask the range of variability among contemporaneous structures (Kramer [n.d.]d). Archaeologists may follow an initial stage of probabilistic sampling (which would monitor room sizes and relative proportions of roofed and unroofed space) with a second stage of excavation utilizing a combination of large quadrats (to expose entire houses and perhaps blocks of houses) and transects (which would facilitate

the assessment of relationships between architectural and diachronic variability across settlements).

Ethnographic data on house sizes and percentage of unroofed area might be used in programs of limited excavation to estimate the number of houses present at a site. For example, in attempting to generate a population estimate for Jarmo, Braidwood lowered his original estimate of 30 houses to about 25 after becoming increasingly cognizant of the importance of nonarchitectural areas in contemporary villages (Braidwood and Reed 1957). Metric data from Aliabad, three times the size of Jarmo (but still a small site), were used to generate a set of estimated house counts (Kramer 1980). The site's area was divided by various theoretical mean compound areas (ranging from 50 to 300 m²) and by theoretical percentages of open area (ranging from zero, assuming total agglomeration, to two-thirds of total site area, about that seen in a number of modern settlements). The resulting contingency table includes estimates ranging from 33 houses (predicted by combining the largest compound area and the greatest amount of open space) to 600 houses (predicted by using the smallest figure for compound area and not allowing for any open space within the settlement). Neither this experiment nor Braidwood's Jarmo estimate takes account of dwelling space within houses, which is pertinent to activities, population size, and other variable features of households. Aliabad's 67 houses have more than 67 "living" rooms. The absence of a one-to-one correlation between the number of houses and the number of dwelling rooms (an assumed correlation that might be implicit in a population estimate such as Braidwood's) suggests that estimated house counts alone may be as misleading as density estimators in that they disregard the possible existence of at least potentially informative variability. Like Sumner's (1979) attempt to integrate prehistoric architectural data from Tall-i Bakun with modern demographic data from the same region to generate a set of prehistoric population estimates, these examples suggest that estimates or reconstructions utilizing ethnographic data should be made in conjunction with archaeological material obtained through a variety of strategies.

SUMMARY

This chapter has focused on late prehistoric occupation in central western Iran. Although additional data are sorely needed, it is argued that palynological, sedimentological, paleozoological, and archaeological data combine to support a fairly unified if thus far coarse-grained picture of the early post-Pleistocene epoch. These data suggest that by about 3500 B.C. many features of modern climate and vegetation were established in the Kermanshah-Hamadan area, and that in broad outline the environmental constraints affecting contemporary villagers are similar to those operating for most of the period extending from the

present to the early fourth millennium. Geomorphological studies suggest that some small early villages are probably buried under later alluvial deposits, biasing current reconstructions of Holocene settlement and land use in the Zagros. Nonetheless, it is fairly clear that in the central Zagros, small villages had appeared as a settlement type by the eighth millennium, and that they did not become numerous or substantially larger until considerably later.

The earliest Zagros villages reflect both a major shift in settlement pattern and a transformation in subsistence strategies. Ancestors of some of the domesticated plant species on which later villagers have relied may have colonized the Zagros area at about 8500 B.C. in association with the oak complex recorded in published pollen cores. Excavations in western Iran have shown that by 5000 B.C. these plants, along with the domesticated animal species so common throughout the Middle East today, were well established as important food sources in the area. They also suggest that by ca. 3500 B.C. some settlements had multiroomed mud structures which sometimes abutted one another and were often remodeled and rebuilt. Excavations at Seh Gabi and other sites indicate that some early villages had multistory structures, courtyards, and a variety of other architectural features similar to those seen in villages in the area today. Data from both excavations and surface surveys suggest that some sites of the fifth and fourth millennia were larger than the 1 ha or less characteristic of earlier periods; in some areas the development of a site size hierarchy and linear patterning of sites suggesting the use of canal irrigation may date to about the same time range.

Ethnographic observations may be applied to analyses of prehistoric settlement pattern and land use systems; some data from Kangavar and neighboring areas were used to illustrate this point. The number and sizes of villages in the Mahidasht, Kangavar, and Hulailan areas today generally exceed those reported for prehistoric periods, suggesting that ancient populations were smaller than those of the present. During some prehistoric periods, however, distances between settlements approximated those observed in the area today. This might suggest that despite differences in technology and resources, sustaining or catchment areas surrounding many prehistoric sites were areally comparable to those of the present. Perhaps the spacing of prehistoric sites is not only related to accessibility of productive resources, but also reflects acceptable ceilings on preindustrial travel time between interacting communities. Despite their limitations, Thiessen polygons and site catchment analysis appear to be useful techniques for analyzing various aspects of archaeological data, and if used together and in conjunction with modern data for the same region they may improve our understanding of prehistoric settlement patterning.

A comparison of settlement-pattern data from Kangavar and nearby Mahidasht suggests that Mahidasht may have been settled earlier and that there may have been subtle differences in their developmental sequences over a fairly short period of time (between ca. 5000 B.C. and 3200 B.C.). The published record for

these and other areas in central western Iran does not yet permit a detailed evaluation of variations within and among sites. However, some aspects of spatial organization within prehistoric settlements may have characterized a wide area. Today, up to about half of a settlement's area may consist of unroofed space. Vernacular architecture can provide useful insights into economic and social variability among households, and archaeologists might formulate sampling strategies designed to maximize their access to residential structures. Ethnographic data on house size and on unroofed areas may be used to generate a range of estimates of raw numbers of houses, but if these are not checked with a variety of excavation tactics there is some risk of perpetuating or reinforcing a normative view of prehistoric villages, which considers one house typical of them all. Such a stance ignores the very variability which will guide us to new questions and research strategies, and to a clearer understanding of the development and elaboration of differentiation within and among communities.

7

Conclusions



Ethnoarchaeological data from a rural Iranian community form the core of this study. By 1975, when my fieldwork was carried out, much of the archaeological research done in the Zagros Mountains of Iran and Iraq had already shown that sedentary village life based on a small complex of plants and animals has a long history, and that the Zagros area was among the first to experience the so-called neolithic revolution. Forms of architecture and processes of architectural decay in this area display many of the features observed at prehistoric sites, and archaeological excavations have revealed patterns of spatial organization that have modern parallels. In contrast to the rich data obtained in archaeological work, ethnographic coverage of the material culture of Zagros villages is relatively sparse. These factors combined to suggest that an archaeologically oriented ethnographic study of a small rural community would be useful: such a study would amplify the published ethnographic record of an adaptation that is about 7000 years old. In specifying the material correlates of activity areas, delineating architectural variability in relation to other features of village organization, and defining patterns of spatial organization within the settlement, the results should provide material for the independent testing of interpretations based on archaeological data and could also be used to generate new hypotheses and to suggest avenues for future research.

Following an extended description of one village, viewed from the perspective of the archaeologist excavating at a single site, I have reviewed materials which "locate" this community within a broader regional framework and which suggest that among villages in the area it is not particularly unusual. They are presented in part from the point of view of the archaeologist who might be primarily concerned with collecting and interpreting surface remains, and among other things point to some of the methodological and interpretive problems raised by contemporaneous settlements of differing size. Finally, a review of paleoenvironmental and archaeological data from this region suggests that various aspects of the modern Zagros village adaptation have considerable time depth, and that there appears to have been some variability both within and among settlements even in the prehistoric period.

SUMMARY OF FINDINGS

In its social organization, subsistence economy and technology, and material culture, the (pseudonymous) village of Aliabad shares many features with a number of other ethnographically documented small rural settlements in Iran and in other parts of Southwest Asia. Aliabad is articulated in a variety of ways in regional, national, and even international economic systems, but its inhabitants report that there is little surplus production and produce is sometimes exchanged through barter; they view the village as the ideal place to live, consider farming and stockbreeding the most attractive economic activities, and describe individuals' wealth in terms of landholdings and flock sizes. Descriptions of other Middle Eastern communities suggest that even today these measures of wealth or economic rank not only matter to villagers themselves but are reflected in variations in material culture, some of which will become part of the archaeological record. Despite a strong egalitarian ideology evident in Aliabadis' words and behavior and reinforced by their interpretation of Islamic principles, some inequalities exist.

In Aliabad and elsewhere in the Middle East, villagers' landholdings are fragmented and spatially dispersed. This serves to minimize risks due to variable soils, topography, and hydrology, and hence to level potential imbalances in productivity. It also allows farmers to produce a succession of diverse crops through the course of the year, and reinforces an ideology of egalitarianism in landholdings. Despite such "leveling mechanisms," not all villagers own the same amount of land and here, as elsewhere, a small number of individuals owns a large proportion of the village lands. Historical studies (Bill 1972; Keddie 1972; Lambton 1953) suggest that this pattern extends into the pre-Islamic period, and that inequalities among groups of Iranian cultivators have not been limited to the recent past.

Despite their differences, all of Aliabad's households are in some way involved with the processing and consumption of local plant and animal products, and remains of these products as well as the technocomplex and household structures associated with them would probably allow archaeologists to develop inferences about land use and subsistence practices. Such remains might also be used to establish households' differential holdings in livestock and land insofar as these are tangibly expressed in residential architecture and compounds' artifacts. Although they might be difficult to operationalize for archaeological purposes, variations in the number and species of animals owned appear to reflect differences in households' economic rank. For example, the presence in compounds of oxen and donkeys seems indicative of households' ownership of or ready access to land; ownership of a horse is limited to the village's two wealthiest households. In theory, the presence of livestock and agricultural products could be inferred from the archaeological remains of such a settlement—in the form of bone and plant remains, associated artifacts, and both features (e.g., troughs) and rooms (e.g., stables, fodder storerooms). Some activities related to both agriculture and livestock are carried out in houses' courtyards, but because courtyards are frequently cleaned and do not necessarily accumulate much of the debris characteristic of particular activities, these and other domestic activities might be virtually invisible archaeologically. However, the Aliabad data strongly suggest that in a formally similar archaeological village in this environment, it would be possible to identify roofed and unroofed areas and, more specifically, to distinguish various activity areas. This could be done through a close analysis of horizontal and vertical surfaces and of built-in features with limited and differentiated spatial distributions.

Variability in the material correlates of economic differences among Aliabad's households is not necessarily marked, but it does exist. It is reflected in residential architecture, mortuary treatment, a variety of portable goods, and frequency of pilgrimage. Exotic items are sometimes imported to the village by pilgrims, who spend considerable sums in travel to religious centers. Some comparatively poor villagers make such trips, and some wealthier ones do not; material evidence of having made the pilgrimage is not an infallible measure of a household's economic position. Some costly objects are also found in relatively poorer houses, having been imported by seasonally migrant male members of landless households, and they too suggest that archaeologists might not only develop measures of the relative costs of portable items but also consider the various circumstances under which they may be acquired. In the absence of a complete inventory of households' portable possessions, it cannot be demonstrated that objects are less useful than architectural measures of variation in household demographics and economic rank. That this may be the case, however, is suggested by the changing value of portable items (such as heirlooms, whose cost may sometimes increase through time), and by the fact that objects are curated,

circulated among households, and discarded in places where they might not be retrieved archaeologically and which may in any case be unrelated to their original use and ownership.

Although a fatal incident that occurred during my fieldwork prevented me from collecting cemetery data as systematically as I had originally planned, the material which I was able to gather shows clearly that mortuary treatment varies with status. Children are treated differently from adults, and the graves of men and women are usually distinctive. There is also a marked imbalance in the proportion of "wealthy" and "poor" graves, which some archaeologists consider characteristic of nonegalitarian societies. The Aliabad cemetery data support the villagers' view that they are egalitarian (since as Muslims all corpses receive comparable treatment), but they also support the conclusion, based on ethnographic observation, that villagers are not socioeconomic equals. Graves are marked in a variety of ways, and at least one of the axes of variability has an economic basis. Although it is usually not possible to ascribe a particular grave to a particular household, the range of variability in Aliabad's grave markers seems broadly paralleled by that observed in some other elements of its material culture, and suggests that mortuary remains can be used to establish the existence, if not the precise scale or content, of socioeconomic variation in the settlement with which they are assumed to be associated. In the Zagros today, cemeteries are often situated at some distance from the settlements with which they are associated; this, and their formal attributes, suggest that such cemeteries would be archaeologically elusive and that strategies for locating them might be refined.

In contrast with their cemeteries, Zagros villages are substantial and visually prominent features of the landscape; as they decay, they become mounds, and many excavations in mounds have revealed the remains of domestic architecture. The construction of standardized residential structures is probably a fairly recent phenomenon, coming with the introduction in state societies of mass-produced "apartment" houses (a very early example is the workers' villages of Amarna-period Egypt; later and perhaps better-known cases have been documented in classical Athens and Rome). Vernacular architecture, in contrast, is variable across space and time, and though it can be modified it is rarely portable and often fairly readily detected archaeologically. Because Aliabad's houses are generally comparable in terms of the activities carried out in them, formal diversity among them cannot be attributed solely to different activities, and other explanations must be sought. Data from this village strongly suggest that economic variations and differences in household size and composition account for much of the architectural variability which can be observed today. Large compounds and even large tents are reported for wealthier social groups elsewhere in Southwest Asia and in other parts of the world, suggesting that the pattern seen in Aliabad may be fairly widespread, and perhaps worthy of further investigation. That variability in vernacular residential architecture can reflect

demographic, economic, and ethnoreligious differences among neighboring households suggests that arguments citing post-marital residence “rules” as the cause of differences in house size require critical scrutiny. If some differences among modern village houses are related to variation in household size and rank, then this may have been the case in nonegalitarian societies in the past as well.

Although the picture is complex, Aliabad’s wealthier households tend to be larger and to have more coresiding nuclear families, and therefore more dwelling space. They also tend to reside in larger compounds than households of lower economic rank. There is limited evidence suggesting that (other things being equal) wealthier village households are more likely to build a second-story room or rooms, and that for a variety of structural and stratigraphic reasons these could probably be reconstructed from their archaeological remains. Ethnographic evidence from other Southwest Asian villages suggests that throughout the area residential structures differ in scale and in materials and that such variability is partly a function of differences in households’ economic statuses. A limited body of evidence from urban centers suggests that this is true in cities as well. There is some evidence that houses of wealthier urbanites tend to be larger, and that they may be located in suburban peripheries; cities’ functional subdivisions as well as their population densities and the localization of different economic groups may vary. If one archaeological objective is to obtain representative samples, a rethinking of excavation tactics and strategies may be in order.

There is apparently no single architectural measure that can be used to rank Aliabad’s households definitively as either “wealthy” or “poor,” or landed or landless, but a group of architectural variables, in combination with variations in houses’ artifacts and, perhaps, food residues, should permit a preliminary ranking of households in a formally similar settlement. Associations between architectural features and economic rank are not entirely clear-cut in Aliabad, partly because for historical reasons landless households have been mobile within and among villages in the area. In addition, houses may be modified as their occupants’ domestic cycles proceed, and some households are particularly vulnerable to short-term climatic and economic fluctuations (so that, for example, although they may have to sell off their flocks, their houses will retain troughs and stables).

Architectural data reviewed in this study suggest that careful microstratigraphic excavation—including systematic dissection as well as the more routine exposure of structures—would be necessary to reveal variations among buildings as well as recycling of activity areas and a range of other modifications within particular buildings. Informal observations of contemporary behavior with respect to structures and trash deposition and removal suggest that even where it is meticulously stratigraphic much archaeological excavation reinforces excavators’ normative assumptions. Excavation strategies may yield evidence of only the most recent of a series of events related to the structures exposed, and thereby collapse an already stratigraphically compressed sequence of architecturally and depositionally re-

lated behavior into a single archaeological event (or "building phase"). Modern villages are sometimes abandoned for periods ranging from a few months to several years; it remains to be determined whether such occupational hiatuses leave tangible evidence. Modification of architectural features and associated surfaces is frequent, often subtle, and occasionally radical. Such alterations can either incorporate earlier structures, or remove them entirely. If (for whatever reason) an archaeologist wishes to reconstruct the history of a structure or a set of related structures, it would seem essential that he or she dissect architecture and associated horizontal surfaces after they have been exposed. Such dissection would not only reveal the recycling of particular rooms (such as the filling in of an oven and the addition of a trough in the conversion of a kitchen to a stable), but would also document the subdivision of a large compound into two or more smaller compounds, and facilitate the identification of contemporaneous compounds, permitting a better-informed investigation of differences among them. In Southwest Asia today one such difference is in frequency of plastering and whitewashing. In western Iran, this behavior may be related to economic differences among households. If it could be demonstrated stratigraphically that two houses were contemporaneous, then such differences between them might be discerned and an explanation offered.

For a variety of reasons it was difficult to reconstruct a detailed chronology for Aliabad, but it was possible to establish the relative ages of blocks of houses, and of houses within blocks, for about the past 50 years. Informants' accounts of the village's architectural history and visual inspection of its buildings suggest that it would be archaeologically feasible to identify structural relationships between adjacent houses of this type, and therefore to reconstruct their relative chronology. The Aliabad data also suggest that the "traditional" Middle Eastern mud or mud-brick house may have a longer life expectancy than is sometimes attributed to it—some buildings in Aliabad are more than 50 years old, and in good condition. Some areas, and portions of older buildings are, however, in a state of disrepair, and in various parts of this and other Zagros villages the process of mounding occurs side by side with the construction of new houses. Information from Aliabad and elsewhere indicating that structural alteration and frequency of plastering vary among households suggests that estimates of archaeological houses' life spans should not be based simply on either the number of plaster layers on their walls or on the number of construction "phases" in buildings.

The internal organization of the village today, and its reconstructed architectural and residential chronology, suggest that people conform in large measure to an expressed ideal that patrilineal kin should live near one another. Subdivision of standing houses and construction of new domiciles are in many cases designed to implement this locational ideal. Aliabad's most recently built structures are located not only at the village periphery but also in the center, reflecting a

diachronic pattern combining both areal expansion and in-filling. Aliabad's area has apparently almost doubled in the last 50 years; houses have also been subdivided, and "empty" spaces like gardens and commons filled in. Thus, density and area have both increased with village age. This pattern of change and the contemporaneity of processes of decay and new construction are reminiscent of the "spiral stratigraphy" observed in excavations at Godin Tepe (Young and Levine 1974). One implication of both the ethnographically and archaeologically observed patterns is that an excavation strategy utilizing only small and widely dispersed trenches will not necessarily permit an accurate assessment of stratigraphic and chronological relationships among houses.

In western Iran and elsewhere in Southwest Asia, many rural settlements are only a few hectares in extent and have populations of a few hundred. However, ethnohistoric materials for central western Iran and gazetteer data for Kangavar and nearby areas suggest that in addition to intrasettlement variability, there are variations in settlement size, population size, and villages' hectarage both within and between regions. Because regional population density and settlement densities vary from one part of Southwest Asia to another today, it would seem inappropriate to use a single population estimator when measuring areas of prehistoric sites in different regions. Even within a single region there may be important differences among settlements. For example, in larger centers, density may increase not only with age but also with settlement function, such that very large centers have higher densities than either rural settlements or small towns. This raises the question of how archaeologists using survey data can most effectively monitor differential densities on the basis of surface remains alone. There is some evidence for positive correlations between population size and settlement area, but this relationship requires further investigation. If population density increases with settlement area, as well as with age, these associations should have implications both for archaeological site classifications based on surface remains and for the formulation of excavation strategies.

Data on modern towns and cities suggest that regardless of their absolute population densities, size hierarchies (based on population and, somewhat less adequately documented here, on site area as well) exist, and that there are breaks between large centers and those which are lower in regional hierarchies. This suggests that such hierarchies would be visible archaeologically, and indeed such an argument based on survey data from a range of geographic areas has frequently been made. However, the relationships among population, area, age, and function must be more fully explored. It is suggested that in excavation, transects from site centers to peripheries might be one means of monitoring differences in structures' densities and, perhaps, of identifying both economic and chronological variability within settlements. In formulating site classifications framed in terms of functional size, archaeologists might also de-

velop diversity measures as well as consider the implications of object density per se, the functions of particular artifact classes, and their differential distributions on sites' surfaces.

Intersettlement interaction is related (among other things) to distances between settlements as well as to differences in their functional sizes. Data from Aliabad suggest that travel from rural settlements to larger centers is in part related to their distance from one another. Despite their administrative affiliations with Tuyserkan and Hamadan, Aliabadis prefer to travel to Kangavar and Kermanshah, both because these centers are Kurdish and because they are somewhat nearer the village. Data from Aliabad also suggest that interactions among inhabitants of settlements within even a small area can vary, and information concerning recent marriages in particular seems to support a gravity model that assumes an inverse relationship between "interaction" and distance. These data suggest that the scale of a plateau effect, presumed by some to be associated with gravity models, may vary from society to society, and that it may in some cases be related to the distance that can be traversed on foot in a single day.

It may also be that distances between neighboring settlements are related partly to a desire for mutual visibility, as well as ease of travel among them, and it is possible that some of the "clustering" of prehistoric sites apparent in archaeological maps of the Kangavar and Mahidasht areas relates to villagers' need to have fairly ready access to other settlements. Prehistoric settlement-pattern data suggest that even when sites were smaller and fewer in number than they are today, many settlements were close to one another when they could (theoretically) have been more dispersed. This may mean that site distributions should not be explained simply in terms of reconstructed subsistence technology or sites' presumed sustaining areas. It is suggested that the present distribution of settlements in the Kangavar area is related to marriage practices as well as to a host of other interactions, and that villages today and in the past are nearer one another rather than more dispersed in part because such spacing facilitates travel and the exchange of spouses, goods, and information. Marriages may also occur in higher frequencies between some neighboring villages than others because of their mutual involvement in such shared resources as *qanats* and canal systems; presumably, such alliances reinforce cooperation in a shared but potentially problematical economic concern.

Some features of the rural economy of central western Iran appear to have a long history. Although recent land use practices have apparently modified the landscape, the climate and climax vegetation of the area have been essentially as they are for at least 5000 years. Archaeologically recovered remains of plants and animals indicate that the major economic species of the present day have played a key role throughout this period. Structural and artifactual remains suggest that many characteristics of contemporary villages (e.g., technology, construction materials and house layout, spatial organization within the settlement) have a

history extending to the fifth millennium. Archaeological survey data suggest that by about 5000 years ago settlement sizes, spatial distributions, and perhaps land use practices were comparable in some important ways to those of the present, although the region supported prehistoric populations considerably smaller than those of today.

In Greater Mesopotamia, archaeological sites dating to the fourth and fifth millennia range in size from less than 1 ha to 10 or 15 ha. By ca. 3000 B.C. the number of settlements in any one area had grown considerably, and some sites of that period (such as Uruk and Susa) exceeded 25 ha in extent. Although it is limited, there is evidence of architectural variation within and among sites of this early time range, and at some sites (such as Tell es-Sawwan) architectural and mortuary data suggest the existence of variation in rank as far back as about 5000 B.C. The cuneiform record indicates that stratified societies existed in Mesopotamia by 3000 B.C., and when more data are available this will probably prove to have been the case in portions of the Zagros as well. Although the sources and scale of today's inequalities no doubt differ in some respects from those of the past, it would be erroneous to assume that the later prehistoric period in the Zagros and adjoining areas was marked by pristine egalitarianism.

Viewed in the broader context of the archaeological record of the Middle East, Aliabad is not particularly large or complex, and the economic ranking and material diversity observable there cannot be dismissed as purely recent phenomena. Aliabad is neither markedly economically stratified nor markedly heterogeneous; despite a strong egalitarian ideology, there are economic variations among its households. Although they are not marked, particularly in comparison with the content and range of variability observable today on the national level and throughout the world, these variations have material correlates. I am not, of course, arguing that modern villagers are in all respects comparable to their prehistoric counterparts, but simply noting that material diversity and systems involving socioeconomic differentiation appear to have substantial time depth in this part of the world. Investigating relationships among these and other aspects of contemporary societies should improve our approaches to and understanding of archaeological manifestations of such phenomena.

PROBLEMS AND PROSPECTS

Some of the gaps in the present study result from unique circumstances arising during my fieldwork, which limited access to some compounds and some villagers and precluded detailed work in the village cemetery, and some questions not asked during my fieldwork emerged during data analysis. It would, for example, be interesting to know whether food consumption varies with economic rank, and what the material correlates of such variability might be. It would also

be useful to have detailed inventories of households' portable property and systematic records of their cash income and expenditures. However, these and other potentially sensitive data are difficult to obtain in a comparatively short period of fieldwork, particularly in a setting where informants assert that they are alike and verbally minimize evidence suggesting that they are not. I suggest that while the absence of such information does not seriously vitiate the general conclusions reached here, the Aliabad material indicates that these and other issues warrant further investigation.

This study suggests that a wide range of additional information on village material culture might be useful to archaeologists. For example, scale maps of a variety of settlements and detailed maps of residential structures within them would help to "place" the single community studied within a broader range of small-scale rural settlements, indicate the range of variation within this category, and permit a more compelling comparison of such settlements with larger centers. With such information we could begin to specify in detail the material and locational correlates of differences in settlement function. Archaeologists have recently turned to geographers, perhaps more often than to ethnographers, for theoretical models focusing on urbanism, empirical data on the nature of urban centers, and theoretical and methodological approaches to regional analysis. Because the study of local, regional, and interregional variation and change figure so prominently in archaeological work, and because both the investigation of urbanism and the methods of surface survey are integral to much archaeological research, it is suggested that archaeologists undertake more extended and varied fieldwork both within contemporary urban centers and on a regional scale.

As the foregoing summary indicates, some of the Southwest Asian material discussed here suggests that population density varies with region, settlement size and function, and probably also with settlement age, and that density may vary within individual settlements as well. The organizational and architectural features of towns are—probably universally—more complex and differentiated than those of villages. However, large portions of the gross area of a settlement of either type may be unroofed. For the archaeologist, therefore, it may be useful not only to determine whether towns call for samples of different size, shape, and location than those used to explore villages, but also to specify assumptions underlying the interpretation of unroofed areas encountered in excavation, and to decide how to obtain optimal samples of architectural rather than open areas. A sampling experiment with the Aliabad map suggested that several standard sampling procedures might provide rough but reasonable guides to the proportions of roofed and unroofed areas. In addition, it suggested that if one wishes to expose large blocks of architecture—whether complete individual structures or several contemporaneous structures—the use of random and systematic samples, and probably even stratified random samples, may be a fruitful preliminary

strategy for locating architectural features. Small dispersed samples, on the other hand, may reveal neither the area of a single house nor variation within it; neither are they likely to expose differences among houses. Given the lack of standardization in vernacular architecture, and the reasonable operational assumption that differences among houses reflect differences among households, archaeologists should refine their methods for identifying and evaluating such variability over space and time.

Two problems raised by the Aliabad data center on livestock but raise more general issues. First, given villagers' at least seasonal reliance on butcher shops in towns or even in nearby villages, there is today comparatively little butchering of village animals over the course of a year; disposal of animal bone involves small quantities as well as processes that result in their dispersal and disappearance. Bone samples obtained in a contemporary village seem to provide a skewed and underrepresentative picture of the village's meat consumption, and might not necessarily reflect variations in individual households' food consumption. Archaeological remains and unpublished information from a few other contemporary Middle Eastern communities suggest that villages vary with respect to the generation and disposal of garbage, and that some archaeological bone assemblages may not have been generated by processes directly analogous to those producing contemporary faunal samples; a systematic comparative analysis of animal bone in modern villages as well as prehistoric settlements would clarify this issue. Refuse disposal is an integral part of the formation of the archaeological record; the study of mammalian and avian bone in particular should shed light on resource utilization and food consumption in and economic variations among households. More ethnoarchaeological research with a taphonomic focus would be instructive in this regard.

Archaeologists' often normative assumptions, the compressed nature of the stratigraphic record, and systematic ("patterned"?) as well as impromptu "earth sculpture" carried out by people modifying their houses may combine to produce a picture of ancient villages more closely akin to a still photograph than to a movie. Archaeologists may utilize "stills" with respect to such features as stables and stalls to infer differences in households' animal holdings, and hence economic rank. The Aliabad data suggest that such assumptions may not always be valid, and that the skeletal information which we flesh out may sometimes lead to incorrect reconstructions regarding variation within and among prehistoric settlements. Aside from the implication that for certain purposes improved approaches to archaeological sampling may be in order, ethnographic observations also suggest that it may be inappropriate and misleading to rely on a single class of economic data. For example, it might not be correct to assume, on the basis of the troughs or stables in a compound, that it had housed livestock throughout the life of its resident household(s). We should attempt to use additional data sets to support inferences regarding such ownership, just as we should specify whether

we are content, given the comparatively crude scale at which we work, to accept the “averaging” implied by both conceptual and stratigraphic conflation or compression.

Today, some Aliabad households without livestock inhabit compounds that have structures related solely to livestock maintenance because households sometimes move from one compound to another. It is widely assumed that agnatic kin will inherit houses, and evidence suggests that in general they do. Perhaps individuals’ mobility both within and among villages is a fairly recent phenomenon. However, the issue of whether inheritance and ownership patterns like those seen today in Aliabad are significantly different from those of prehistoric systems is in some respects academic. In this area the village adaptation, centering on exploitation of both land and livestock, is ancient, and it functions within environmental constraints of long standing. Lambton has noted that after recent land reforms, when villagers could no longer be removed from their homes at landlords’ whims, they began to invest in home improvement. Some were—and are—better able to do so than others, and these differences are evident in some of the formal variability among houses. After land reforms in the early 1960s, some Iranian villagers were able to purchase land on an installment basis, and others were not, despite the fact that previously many of them had had essentially the same landless status. Thus, even when freed from the complex relationships of obligation and subjugation to a landlord, villagers did not automatically become equal; even today, when all (theoretically) have had some opportunity to accrue sufficient capital to buy land once transfers become legal, not all will be able to do so.

To those who would argue that data from contemporary villages like Aliabad are not relevant to the study of prehistoric villages because they are integrated in a number of ways and at a variety of levels with national and even international economic systems, one can counter that no village has ever been wholly self-sufficient, if only because information, goods, and spouses must be exchanged, and that settlement and administrative hierarchies reflecting the articulation of differentiated sites on a regional scale have a long history. The form and scale of interaction today may differ in some respects from those characterizing prehistoric periods, but some of the principles may well be comparable. Along with larger-scale as well as local variability and inequality there is a persisting ideology of local-level egalitarianism, and in combination with the subtlety and small scale of tangible differentiation on the local level such an ideology may be the basis for some ethnographers’ claims for an absence of material differences among households. In an unstable and uncertain environment, where 1 year in 5 can be agriculturally disastrous and where there is a history of uncertainty about residential security and a vulnerability to tax collectors, bandits, and landlords’ predations, it is not surprising that social mechanisms designed to minimize and spread risks have been developed and elaborated at the community

level. In combination with reports from a number of other societies that observable differences in economic rank are not accompanied by marked differences in material culture, the circulation of such (numerically rare) items as grinding stones and scythes, villagers' claims that all houses are alike, their assertions that sheep and goat meat sell for the same price in towns' butcher shops, the contributions of all households to certain village functions, and the distribution of individuals' fields across lands of variable quality would appear to be part and parcel of the same complex. Even without Islamic theory and praxis, one might expect an egalitarian ideology in such circumstances. In such a setting, it would not be expedient to flaunt differences from or increase the possibility of isolation from one's neighbors. This is not to suggest that differences do not exist; rather, it underscores the need for a more concerted and systematic effort to define material correlates of various forms of inequality, and to develop operational means of identifying them archaeologically.

In western Iran, and in Southwest Asia more generally, the history and current nature of resource utilization and subsistence technology might warrant more detailed investigation. For example, farming technology, land and labor requirements for farming and herding, timing of access to water, dispute adjudication, and other decision-making processes all affect relationships within and among communities. Increases in productivity attributed to irrigation may be associated with changes in consumption and in exchange strategies, and in the Middle East the introduction of irrigation technology seems to have been associated with transformations in settlement pattern and political organization, as a number of seminal archaeological publications have clearly indicated. No systematic investigation of contemporary irrigation practices has yet been attempted in the area considered here, but it would seem a subject worth exploring in detail. Relations among settlements using the same water source may change through time, and differential access to water may have material correlates. One of the few anthropological studies of irrigation in Greater Mesopotamia (Fernea 1970) contains hints that there may be interesting locational and material correlates of relationships between settlements using the same irrigation system, and it is possible that there are significant functional, areal, and chronological differences among settlements along even a single canal. Today, the village with which Aliabad's inhabitants are most likely to intermarry and with which good relations seem most often to be underscored is also the source of its irrigation water. This village, possibly the older of the two, is substantially larger than Aliabad in both population and area, owns more fields (some of which border Aliabad's), and is also functionally larger, having several specialized shops as well as a shrine and a mosque. Within Aliabad, the wealthiest household is located farthest upstream, in the largest house; this pattern is also reported for settlements in the Yazd area to the east (M. Bonine, personal communication) and could no doubt be found elsewhere as well. The expansion upstream of the village or even

of this household's compound is deemed unlikely by Aliabadis because of the existence there of the cemetery, a tangible barrier whose location with respect to Aliabad's nearest neighbor may not be wholly fortuitous.

The location and size of sites in a regional hierarchy may be related to differential access to water or other critical resources. Prehistoric survey data from Kangavar and nearby Mahidasht suggest that (areally modest) site size hierarchies appeared at about the same time as linear site alignments. If there is a causal relationship between site area and site function, and if early size hierarchies reflect the regional dominance of some sites, then the nature of their spatial and chronological relations to possible canals should be more firmly established. The data reviewed here do not permit such an analysis, but it would be interesting to know whether the larger sites in this area are farther upstream and/or older than smaller sites. In central western Iran, many prehistoric sites are smaller, and the distances between them apparently less, than is the case in the earliest site hierarchies reported for Mesopotamia (Adams 1965:36; Adams and Nissen 1972:11). Present evidence suggests that the earliest Mesopotamian ranking was roughly contemporary with the introduction of canal irrigation, and that both were substantially earlier than apparently comparable developments in the Kermanshah–Hamadan area. In central western Iran, site size hierarchies appear to be earlier in some areas than others, but as in Mesopotamia they appear to have been associated with the development of linear site distributions. Ethnohistoric and ethnographic data collected on a regional scale and delineating material correlates of relationships among settlements' areas, population sizes, functions, interactions, use of shared water, and differential productivity might be used both to evaluate hypotheses based on archaeological data and to suggest new lines of investigation.

These and a host of other problems might be addressed, in ethnoarchaeological research, by archaeologists working in contemporary settings. This study, perhaps raising as many questions as it answers, is meant to point toward a few of the many paths down which we might travel in exploring relationships between human behavior and its material correlates.

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